News about

B. F. Goodrich Chemical *raw materials*

Improve and save on your rubber processing with Good-rite Vultrol

*REG. U. S. PAT. OFF.

Vultrol

...PROTECTS AGAINST SCORCHING
...PERMITS UNINTERRUPTED PRODUCTION
...REDUCES "DEAD" STOCKS
...REQUIRES NO SPECIAL HANDLING

Good-rite Vultrol offers you many advantages for rubber processing. It is ideal for preventing scorching not only during the hot weather months—but the year round. It retards scorch at processing temperatures, and also acts as a mild activator at curing temperatures.

Check these additional Vultrol advantages. It is beneficial on heavy-loaded or highly-accelerated compounds, and is particularly effective with high abrasion furnace blacks.

Supplied as a free-flowing flake, Vultrol requires no special handling—is non-toxic. It is most effective when added to the latter stages of mixing. Economical and easy to use. Saves time, money and labor! For further information about Good-rite Vultrol, please write Dept. CA-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

B. F. Goodrich Chemical Company
A Division of The B. F. Goodrich Company

Good-rite *Rubber Chemicals*

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON organic colors

The **PHILBLACK*** family wishes you The best of luck the whole year through!

PHILLIPS CHEMICAL COMPANY

PHILBLACK SALES DIVISION

EVANS BUILDING · AKRON 8, OHIO

PHILBLACK EXPORT SALES DIVISION • 80 BROADWAY • NEW YORK 5, N. Y.

* A Trademark

Philblack E, Philblack A and Philblack O are manufactured at Borger, Texas. Warehouses in Akron, Boston, Chicago and Trenton. West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.

No water extraction
Best color retention
Positive antioxidant protection

with *Wing-Stay S*

IN FISHING lures, bathing caps, surgeons' gloves—wherever light-colored or white rubber products are washed, sterilized or just immersed in water – it pays to use WING-STAY S for antioxidant protection. For under ordinary conditions, this antioxidant is *never* removed by water. This assurance of lasting protection is coupled with the best color retention – all at surprisingly low cost.

If you are now using any of these GR-S rubbers–1006, 1012, 1502 or X693 – you already have these advantages of WING-STAY S working for you. For since August 1951, more nonstaining GR-S has been made with WING-STAY S than with all other antioxidants combined.

You can safely turn to this use-proved antioxidant, thanks to large production facilities that assure you of a dependable supply. Write for further details to:

Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL
GOODYEAR
DIVISION

Chemigum, Pliobond, Pliolite, Pliovic, Wing-Stay–
T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Use Proved Products — CHEMIGUM • PLIOBOND • PLIOLITE • PLIOVIC • WING-CHEMICALS — The Finest Chemicals for Industry

MR. CLIMCO SAYS...

LINERETTE PAPER

is *ideal* for separating lightweight stocks

In use for over 20 years, Linerette is a quality, specification sheet that provides a quick and easy way to separate stock without adhesion. Linerette preserves the tackiness of the stock and contains no oil or wax which might migrate.

LINERETTE is furnished in any width up to and including 54", in rolls of 9", 11½", 13", and 15" diameters; put up on 3" i. d. cores. The yield is approximately six square yards to the pound. A 9" roll contains 375 linear yards and a 15" diameter about 1150 linear yards.

SEND FOR SAMPLES—simply specify width desired.

THE CLEVELAND LINER & MFG. CO.
5508 Maurice Ave. • Cleveland 27, Ohio, U.S.A.
Cable Address: "BLUELINER"
West Coast Representative:—MERIT WESTERN CO.
1248 Wholesale St., Los Angeles 21, Calif.

ILLUSTRATED LINER BOOKLET

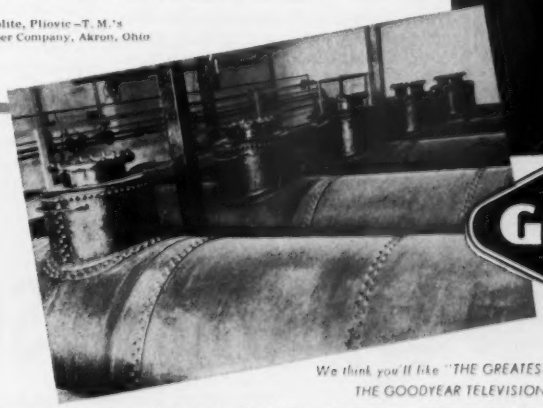
Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

MADE BY THE MANUFACTURERS OF CLIMCO PROCESSED LINERS

LINERETTE
INTERLEAVING PAPER

CLIMCO

Look where they're using Chemigum



TYPICAL CHEMIGUM USES

resisting heat, oil, grease, gasoline, solvents

Fuel Oil and Gasoline Hose
Pipe Line Connections
Printers' Rolls and Press Blankets
Valve Inserts
Gaskets for grease and solvent containers
Cements and Adhesives
Plasticizer for vinyls and phenolics
Oil-resistant Shoe Soles and Heels
Molded Automotive Parts
Cable Covers
Tank Linings
Hard Packing Compounds
Synthetic Ebonites
Coated Fabrics
Conveyor Belt Covers and Friction Compounds
Chemical Piping
Fuel Cells and Containers

Wherever close tolerances, physical properties and good appearance must be maintained, along with outstanding resistance to heat aging, oils, greases and solvents, you can count on CHEMIGUM. This use-proved Goodyear synthetic is the easiest-processing nitrile rubber you can use.

Ask for full details today by writing:

Goodyear, Chemical Division, Akron 16, Ohio

Chemigum, Pliobond, Pliolite, Pliovic—T. M.'s
The Goodyear Tire & Rubber Company, Akron, Ohio

CHEMICAL GOODYEAR DIVISION

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network
THE GOODYEAR TELEVISION PLAYHOUSE every other Sunday—NBC TV Network

Use-Proved Products — CHEMIGUM • PLIOBOND • PLIOLITE • PLIOVIC • WING-CHEMICALS — The Finest Chemicals for Industry

"Out in the cold"? Not with Skellysolve!

Skellysolve for Rubber and Related Industries

Applications

SKELLYSOLVE B. For making quick-setting cements for the shoe, tape, container, tire and other industries. Quick-drying, with no foreign taste or odor in dried compound. Closed cup flash point about —20°F.

SKELLYSOLVE C. For making quick-setting cements with a somewhat slower drying rate than those compounded with Skellysolve B. Closed cup flash point about 13°F.

SKELLYSOLVE D. For cements and variety of manufacturing operations. Good odor. Quick drying. Minimum of heavy, greasy compounds. Closed cup flash point about 3°F.

SKELLYSOLVE H. For general use in manufacturing operations and cements, where faster evaporation rate than that of Skellysolve D is desired. Closed cup flash point about —20°F.

SKELLYSOLVE V. For use wherever a relatively slow drying solvent is desired. Closed cup flash point about 50°F.

SKELLYSOLVE R. For general use in tire building and a variety of other manufacturing operations and cements. Reduces evaporation losses. Medium quick final dry. Lessens bloating and skinning tendency. Closed cup flash point about —25°F.

"DOC" MacGEE SAYS: Your product will never be "out in the cold" because of solvent uncertainties—not when you standardize on Skellysolve. More than 20 years' experience proves you can depend on Skellysolve to guard the quality of your product—and to help keep your plant operations rolling smoothly . . . with no time out because of solvent let-downs.

You're never in doubt about Skellysolve's uniformity. Every batch has the same over-all properties to protect your product's high quality and to enhance its sales appeal. Here is uniformity guarded by Skellysolve's laboratory tests, unsurpassed manufacturing methods, plus strict quality controls. Remember, too, that Skellysolve is not a "sideline" with us, but a major product operation.

What features do you look for in your solvents? If they're low end points, controlled evaporation, low vapor pressure, a minimum of unsaturates and pyrogenic decomposition products—you get them *all* with Skellysolve!

And Skellysolve's minimum of low and high boiling compounds helps reduce rejects due to blushing and blisters. Controlled vapor pressure reduces danger of bloated containers . . . and minimum of low boiling compounds eliminates "seeds" from rubber cements. Freedom from greasy residues assures rubber cements of high bonding strength.

Write now for more complete technical facts. And if you require special help on solvent applications, you are invited to consult with the Skellysolve Technical Fieldman.

SKELLY

Skellysolve

SOLVENTS DIVISION, SKELLY OIL COMPANY,
KANSAS CITY, MISSOURI

Cut your scrap loss with Pliovic

Re-runs of trim like this are easy with PLIOVIC G90V

You will find – as many vinyl processors have already discovered – that you get less scrap, more re-usable trim, tailings and ends when you turn to PLIOVIC G90V – Goodyear's new polyvinyl chloride resin.

That's because PLIOVIC G90V has outstanding heat stability–giving less degradation and loss of physical properties when reworked. It also permits high calender speeds and fast extrusions that mean more production.

PLIOVIC G90V has a high uniform bulk density for ease in handling – good color for use in clear or pigmented compounds – and can easily be compounded for use in a wide range of products.

First in a series of polyvinyl chloride resins, PLIOVIC G90V is another use-proved product by Goodyear. Write for full details today to:

Goodyear, Chemical Division, Akron 16, Ohio

Pliolite, Chemigum, Pliobond, Pliovic–T.M.'s
The Goodyear Tire & Rubber Company, Akron, Ohio

CHEMICAL
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We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network
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Use-Proved Products • CHEMIGUM • PLIOBOND • PLIOLITE • PLIOVIC • WING-CHEMICALS • The Finest Chemicals for Industry

Titanox-for GOOD LOOKS in WHITE WALLS

White sidewalls pigmented with Titanox titanium dioxide pigments are the cleanest, brightest white you've ever seen and they stay that way. Titanox pigments can contribute more to white sidewalls than just good looks. Indications are that Titanox "non-chalking" rutile pigments—especially TITANOX-RA-NC—fortify white walls against crazing, chalking and checking... help maintain the even, brilliant original white of new tires.

Physically and chemically stable, Titanox titanium dioxide pigments are compatible with natural and synthetic rubbers, as well as compounding ingredients. Our Technical Service Department is ready at any time to help you choose the best Titanox pigments for your rubber formulations. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

1158

® TITANOX

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of NATIONAL LEAD COMPANY

RUBBER FABRICATORS NEED ACCURATE CUTTING DIES

For Cutting

Rubber, Neoprene, Plastics, etc.
Sheeting, Foam, Sponge, Cellular,
Cured & Uncured

Gang Dies Our Specialty

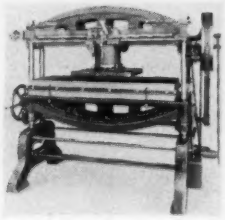
- Accuracy to close Tolerances
- Durability
- Genuine Understanding of the problems of rubber goods manufacturers

MALLET HANDLE DIES

PURPOSE — For those who have no machinery and do not wish to purchase any. For Cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from bolts or not.

SERVICE—One to three days.



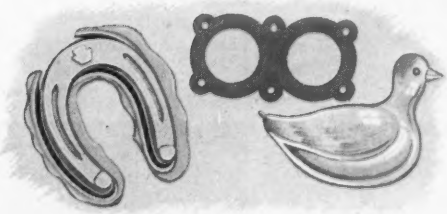
STEEL RULE CLICKER DIES

Use On Clicker Machine or Dinker Press

PURPOSE—For Cutting Rubber, Neoprene, Plastics, etc.

ADVANTAGE — More reasonably priced than the all steel dies. Recommended for small and medium quantities where cost of an all steel die is not warranted.

SERVICE—One day service.



Dies for cutting
Gaskets, flashing from molded parts, rubber soles, foam and sponge for furniture padding, inflated toys, clothing and footwear, etc.

STEEL RULE CUTTING DIES

Used on Die Cutting Press, Printing Press or Power Press

PURPOSE — Especially suited for cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE—Low in cost. Suitable for long production runs. It is necessary to cut from rectangular sheets which are fed into the press.

SERVICE—One day service.

ALL STEEL DIES

Use On Clicker Machine or Beam Press or Power Press

PURPOSE—For Cutting—Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from rolls without first cutting into sheets.

SERVICE—One to three day service on dies.

DIE CUTTING SERVICE

PURPOSE—For those who prefer to have their cutting done by others.

ADVANTAGE—We can die cut your product for you on our own presses rapidly and economically at a low "per thousand" cost.

SERVICE—One to three days.

SAME DAY SERVICE

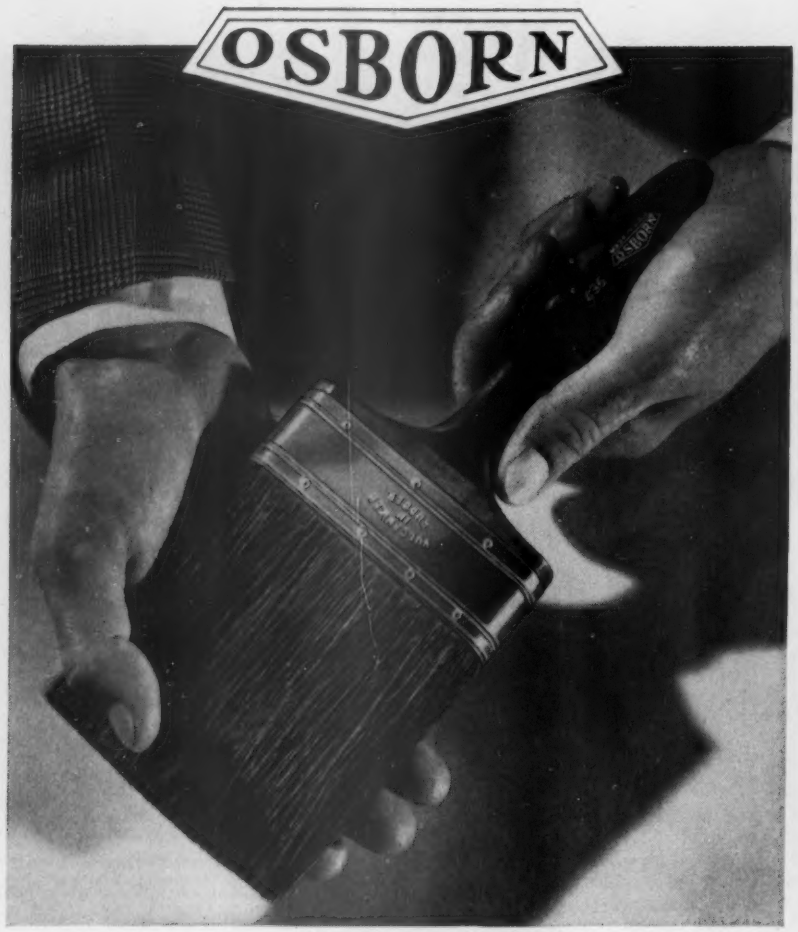
ACCURATE

STEEL RULE DIE MANUFACTURERS

24-28 West 21st Street, New York 10, N. Y. CHelsea 2-0860-1

Subsidiaries: American Fabricators; Interstate Die Cutting Co., Inc.

Intelligent Service to the Rubber Goods Industry for Over 22 Years

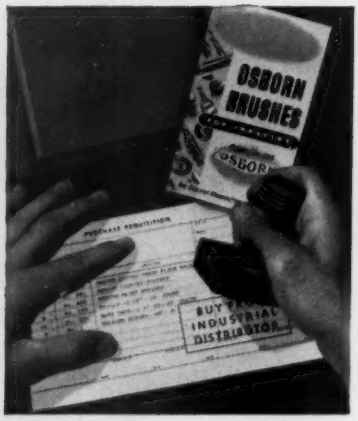


Why shop around? Just specify "OSBORN"

YOU KNOW OSBORN Brushes are good. To simplify buying and to assure getting unsurpassed quality, all you need to do is *specify* "OSBORN". No need for shopping around. No chance for questionable quality. You can buy OSBORN paint, maintenance and power brushes with confidence because their workmanship and materials are backed by 60 years of OSBORN service to Industry. Order them automatically from your INDUSTRIAL DISTRIBUTOR on the same order as other mill supplies. *The Osborn Manufacturing Company, Dept. 907, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES



IT'S SIMPLE. You can make one order cover OSBORN brushes and other leading-brand mill supplies when you buy from your Industrial Distributor. This standard practice streamlines your purchasing, cuts your supplies inventory, assures you good service on top quality products.

HANDY STOCK. Your Industrial Distributor carries a large stock of OSBORN brushes to supply you with the right type of brush promptly. Saves your time. The OSBORN Master* Sweep Floor Brush shown is a nationally recognized product.

FOR YOUR NEEDS. There is a complete line of Osborn power brushes to meet your cleaning and finishing problems. Built for Industry by the Company that knows Industry's problems. They do their jobs thoroughly and fast. *Trade-mark.

NEVILLE

R-16 / R-16A

PARADENE

FOR WIRE INSULATION

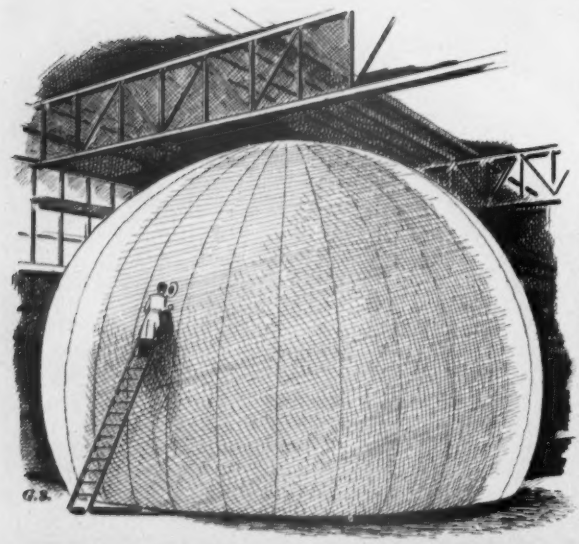
These coumarone resins are excellent, economical softeners, pigment-dispersing aids, and extenders in both natural and synthetic rubber wire insulation compounds. In themselves they have excellent electrical properties, impart high tensile with good elongation, good tear resistance, and produce a more uniform compound with a minimum of mixing.

They have been proven the optimum softeners and pigment-dispersing agents, particularly with the more difficult non-carbon black reinforcing fillers.

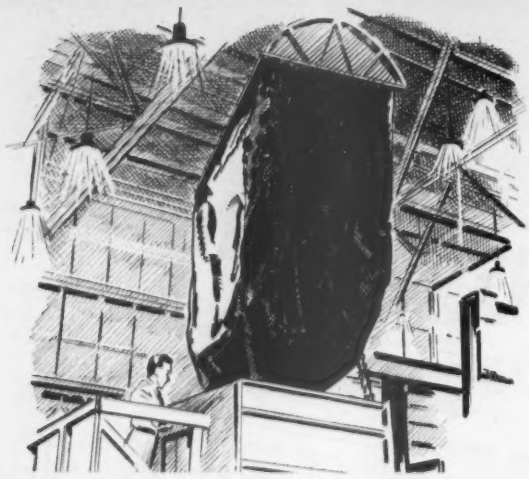
THE NEVILLE COMPANY
PITTSBURGH 25, PA.
Plants at Neville Island, Pa., and Anaheim, Cal.

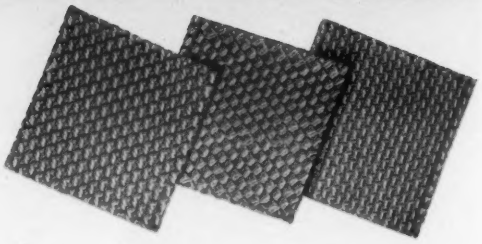
R-48

Chemicals for the Rubber Industry



If it's got to have DEPENDABLE SERVICE LIFE





make it a WELLINGTON SEARS "fiber-engineered" fabric

Military applications rank among the sternest types of "proving ground" for the rubber industry's uses of Wellington Sears fabrics. Although best known for its extensive line of cottons, Wellington Sears has developed for military and other uses many new fabrics which take full advantage of the unique properties of man-made fibers—alone, or in combination with cotton.

You'll find rubberized nylon fuel cells in aircraft and vehicles; radar equipment housed in pressurized radomes of two-ply nylon or Fortisan* fabric; inflatable pontoons of rubberized nylon for floating bridges. Wherever the emphasis lies . . . on strength, lightness of weight, abrasion resistance . . . there's a practical solution to be found in a Wellington Sears fabric, "fiber-engineered" for the job. Your nearest Wellington Sears sales office will supply you with full information.

An illustrated 24-page booklet filled with valuable facts on fabric development and applications of interest to present and potential users of industrial fabrics is yours for the asking. Write for a free copy of "Modern Textiles for Industry" to Wellington Sears Company, Department L-4, 65 Worth Street, New York City 13, New York.

®Celanese Corp. of America

Superior Fabrics for the Rubber Industry

- Belting duck
- Hose duck
- Enameling duck
- Army duck
- Single and plied-yarn chafers
- Sheeting
- Airplane cloth
- Balloon cloth
- Nylon, high-tenacity rayon, other synthetics and combinations.

Wellington Sears

A SUBSIDIARY OF WEST POINT MANUFACTURING COMPANY

FIRST In Fabrics For Industry

WELLINGTON SEARS COMPANY, 65 WORTH STREET, NEW YORK 13, N. Y.

OFFICES IN: ATLANTA · BOSTON · CHICAGO · DETROIT · LOS ANGELES · NEW ORLEANS · PHILADELPHIA · SAN FRANCISCO · ST. LOUIS

For good whiteness . . . or true blues
in rubber or plastic tile
specify Calco's

ULTRAMARINE BLUE

59-1824
59-3584
59-5604
59-6204

High resistance to alkalis and soaps

For maximum brilliance in whites specify UNITANE® 0-220 (Titanium Dioxide) . . . for maximum strength and hiding, UNITANE OR-350.

You get highest color purity in Calco's Ultramarine Blues. Calco types are formulated to cover a wide range of shade, clarity and strength to give maximum versatility in compounding.

You can make your selection of these popular pigments according to the properties listed in the table—or call in your Calco representative for complete information.

	Tint
Calco Ultramarine Blue 59-1824	Reddest
Calco Ultramarine Blue 59-3584	Intermediate (Med. Red)
Calco Ultramarine Blue 59-5604	Intermediate (Med. Red)
Calco Ultramarine Blue 59-6204	Greenest

AMERICAN Cyanamid COMPANY
CALCO CHEMICAL DIVISION, PIGMENT DEPARTMENT
BOUND BROOK, NEW JERSEY

Branches and Warehouses in Principal Cities

Calco®

all in partnership with rubber...

but no two wires alike!

● Pictured above are four typical examples of the many special-purpose wires developed by National-Standard for wire-in-rubber products.

They do have one essential quality in common —a highly developed affinity for adhesion with rubber. But beyond that, each has a different job to do . . . and is painstakingly engineered to do it . . . effectively!

For years National-Standard has specialized in improving the behavior of wire in rubber—digging into all the intricacies of application, fabrication, finish, corrosion, strength, elongation, adhesion and innumerable details you might never bother with.

Main reason for all this research, this "groundwork", is to help you improve your products, increase production, conserve materials and cut costs! Perhaps you now face *new* defense production problems involving wire. Remember, National-Standard service is always at *your* service.

NS
NATIONAL-STANDARD Company
NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Fabricated Braids and Tape
REYNOLDS WIRE	*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Lithographing and Special Machinery
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

You Will Want THIS BOOK

Erie Foundry
HYDRAULIC PRESSES

For Rubber Working
Multiple Opening Platen
Self-Contained Forming
Mechanical Goods Presses
Extrusion Presses
Special Purpose Presses
Abrasive Molding
Die Hobbing Presses
Light Precision Molding
Presses for Diverse Applications

Write for Your Copy of Bulletin 350

ERIE FOUNDRY COMPANY HYDRAULIC PRESSES

ERIE FOUNDRY COMPANY • *Erie, Pa., U.S.A.*

DETROIT 335 Curtis Building • CHICAGO 13 South Austin Blvd. • INDIANAPOLIS 2302 N. Meridian Street • NEW ENGLAND G. V. Eads, Kent, Conn.

"Every dollar --double duty . . ."

HARVEY S. FIRESTONE, JR.
Chairman, The Firestone Tire and Rubber Company

"Every dollar invested in U.S. Defense Bonds does double duty. Through the Payroll Savings Plan we help in the building of national defense and, at the same time, provide for personal security in the years to come. The Firestone organization is proud that more than 29,000 of our employees are participating in the Payroll Savings Plan."

Do America's wage earners appreciate that double duty feature of Defense Bonds? Let's take a quick look at a few figures:

- 7,500,000 employed men and women are investing *one hundred and fifty million dollars per month* in Defense Bonds through the Payroll Savings Plan.
- The number of Payroll Savers is going up steadily.
- In the first six months of this year, sales of Series E $25 and $50 Bonds—the payroll savers' sizes—totaled 33,946,000 pieces—an increase of 22% over the corresponding period of 1951.
- Sales of E Bonds in January-June, 1952 totaled $1,715 million—5% more than in the same period of 1951. (The Payroll Savings Plan is the backbone of E Bond sales.)
- Today Americans hold a cash value of more than $49 billion in Savings Bonds. Their holdings of E Bonds—the Series bought by Payroll Savers—are now $35 billion—$5 billion greater than at the end of the war.

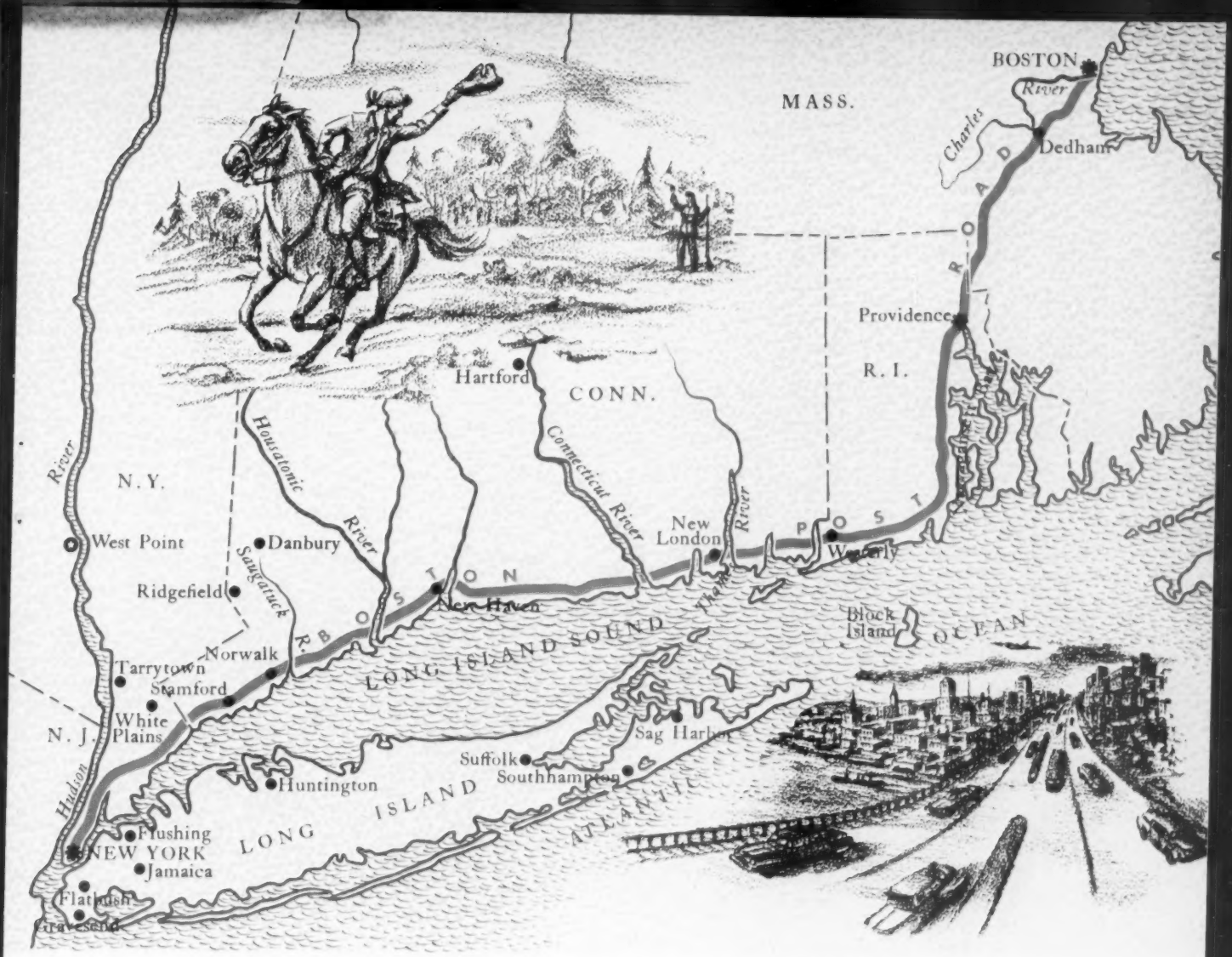
What are *you* doing to help *your* employees build for national defense and personal security?

If you have a Payroll Savings Plan, and participation is less than 50%, conduct a person-to-person canvass of employees of your plants and offices. Make sure that a Payroll Application Blank is placed in the hands of every employee. He or she will do the rest. Participation in your Plan will jump to 60%, 70%—even higher, as it has in hundreds and hundreds of plants that have conducted similar canvasses.

If you do not have the Payroll Savings Plan, phone, wire or write to Savings Bond Division, U.S. Treasury Department, Suite 700, Washington Building, Washington, D. C. Your State Director will help you to install the Plan—or to conduct a person-to-person canvass.

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

RUBBER AGE



One in a Series of Famous Trails, a Reminder of Man's Progress in Transporting Himself and His Products.

Boston Post Road

A score of years after the *Mayflower* landed, there were 20,000 people living in New England in clusters of separate little communities, connected by Indian trails and water travel. In 1639, the Massachusetts General Court provided for a road between Boston and Plymouth. This small stretch of road became a part of one of the most famous highways in America. The Boston Post Road, which connected Boston with New York. The Boston Post Road is now part of the famous U. S. Route 1, which follows the Atlantic coastline from Maine to Florida.

On January 22, 1673, the first post galloped northward from New York on a mission from the Governor of New York to create good will and understanding between the two settlements. The first mailman in America took three weeks to make the 250-mile trip; in 1772, the first trip was made by public conveyance, or stagecoach, though wagons hauling freight from city to city began to appear early in the 18th century.

George Washington, rushing from Philadelphia to Boston in 1775 to take command of the Continental Army was 12 days in making the journey.

How far man has come in his ability to transport himself and his products! Days of laborious travel have been reduced to hours, and minutes. Indian trails and primitive roads have given way to a network of highways which have eliminated remoteness from every section of the land.

And wherever man goes, and wherever the products of his labor, farm or factory are shipped the rubber tire is his fast and dependable servant in transportation.

.....

There came a time in the development of the rubber tire when it was discovered that the addition of carbon black gave a strength and durability previously undreamed of. Tire manufacturers thus supplied a product equal to the transportation needs of the day.

United Carbon, Inc., was one of the early producers of dependable carbon blacks for the rubber industry. It has kept in advance of the needs of the industry, supplying tire producers with carbon blacks geared to their needs and requirements.

UNITED CARBON COMPANY, INC.

Dixie 60 is a High Abrasion Furnace (HAF) carbon black that is earning top rating for better processing, high reinforcement, and noteworthy resistance to abrasion.

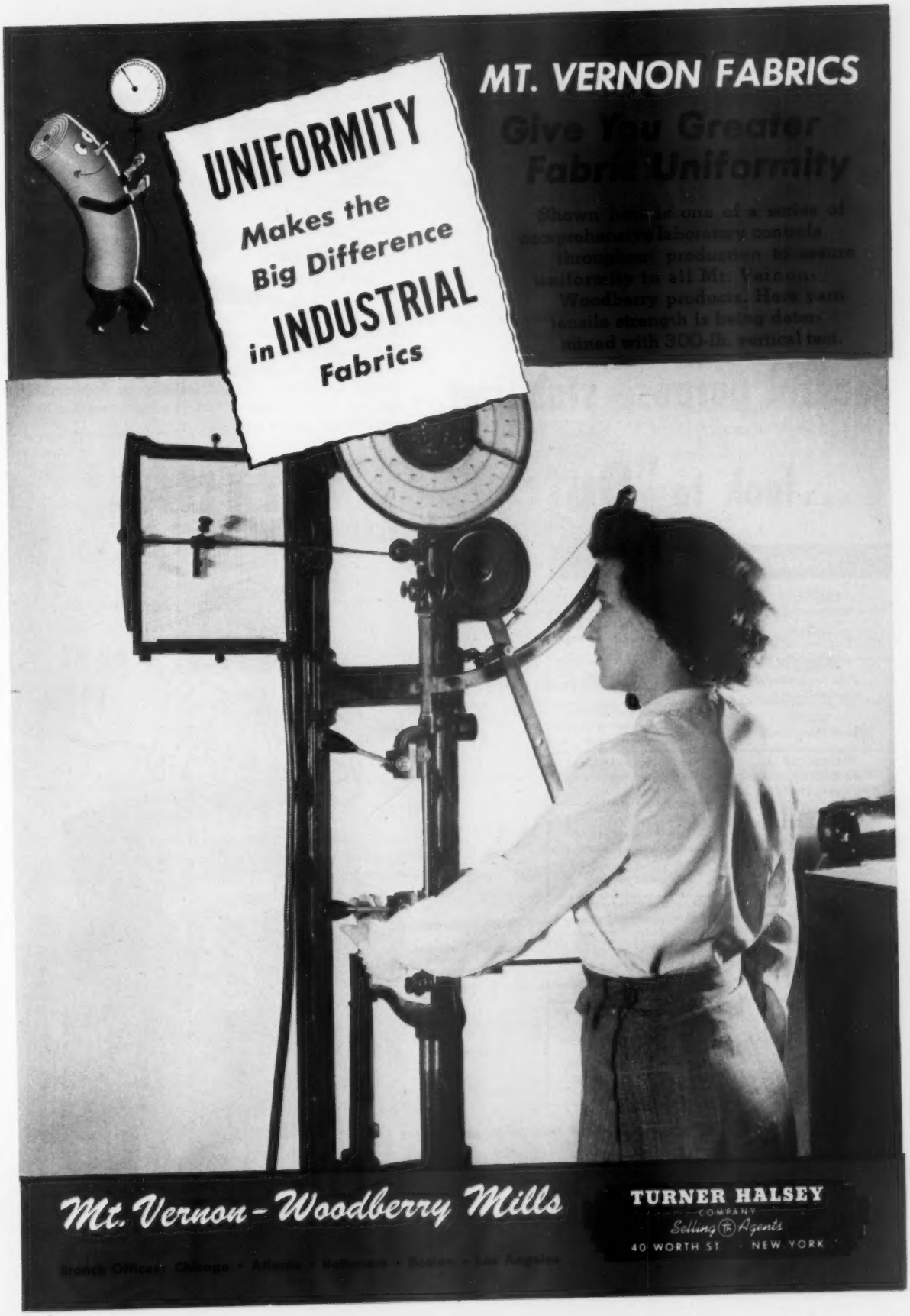
Dixie 60 is scientifically produced from special fuel in a most modernly designed furnace plant. Its manufacture is constantly controlled to yield a highly uniform carbon black of assured quality for the rubber industry.

Ease your tread problems with Dixie 60.

UNITED CARBON COMPANY, INC.

CHARLESTON 27, W. VA.

NEW YORK AKRON CHICAGO BOSTON
CANADA: CANADIAN INDUSTRIES, LTD.


MT. VERNON FABRICS
Give You Greater
Fabric Uniformity
Shown here is one of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products. Here yarn tensile strength is being determined with 300-lb. vertical test.
UNIFORMITY
Makes the
Big Difference
in INDUSTRIAL
Fabrics
Mt. Vernon - Woodberry Mills
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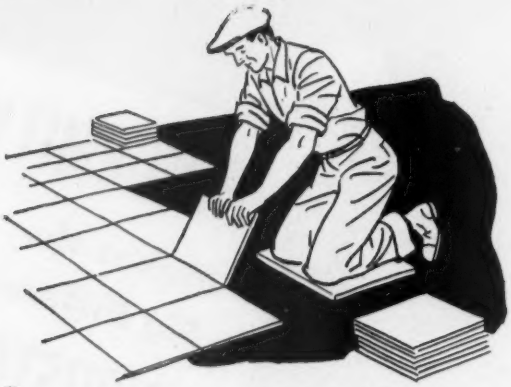
TURNER HALSEY
COMPANY
Selling Agents
40 WORTH ST. · NEW YORK

If you're looking for a good general purpose stabilizer



1. EXCELLENT HEAT AND LIGHT STABILITY: Dythal's high available basic lead content assures heat stability in processing. Its excellent ultra-violet light absorption makes for improved light stability in your finished product. It provides low tinting strength, and thus helps make bright colors possible.

...look to "Dutch Boy" DYTHAL

"Dutch Boy" Stabilizers

PRODUCT	USE
TRIBASE (Tribasic Lead Sulphate)	Electrical and other compounds requiring high heat-stability
TRIBASE E (Basic Lead Silicate Sulphate Complex)	Low volume cost insulation
DS-207 (Dibasic Lead Stearate)	Stabilizer-lubricant for sheeting, film, extrusion and molded compounds
PLUMB-O-SIL A (Co-precipitate of Lead Orthosilicate and Silica Gel)	Translucent and colored sheeting and upholstery stocks
PLUMB-O-SIL B (Co-precipitate of Lead Orthosilicate and Silica Gel)	Translucent and colored film, sheeting, belting
PLUMB-O-SIL C (Co-precipitate of Lead Orthosilicate and Silica Gel)	Highly translucent film and sheeting
DYTHAL (Di-basic Lead Phthalate)	General purpose stabilizer for heat and light. Good electrical properties
DYPHOS (Di-basic Lead Phosphite)	Outstanding for heat and light in all opaque stocks, including plastisols and organosols
NORMASAL (Normal Lead Salicylate)	As stabilizer or co-stabilizer in vinyl flooring and other compounds requiring good light-stability
BARINAC (Barium Ricinoleate)	Stabilizer-lubricant for clears

2. GOOD ELECTRICAL PROPERTIES: Dythal is particularly effective when used in high temperature insulation compounds.

3. EVEN DISPERSION, LOW VOLUME COST: Dythal disperses uniformly throughout ... gives excellent results in film and sheeting, in extrusions (especially on wire), and in plastisols. If you want to extend the life of your plastic compounds, investigate "Dutch Boy" Dythal, general purpose stabilizer. Consult our technical staff for additional information and data. Write today.

Dutch Boy* CHEMICALS

*Trademarks Reg. U. S. Pat. Off.

NATIONAL LEAD COMPANY

111 Broadway, New York 6, N. Y.

Paracril®

THE OIL-RESISTANT CHEMICAL RUBBER

Relative characteristics of standard grades

GRADES	CHARACTERISTICS	
C CV CS	NITRILE CONTENT HIGH	As nitrile content increases • oil resistance improves • tensile strength increases • processibility improves • less rubbery resilience—higher set
B BJ BV	NITRILE CONTENT MEDIUM	
18-80 AJ	NITRILE CONTENT LOW	As nitrile content decreases • low-temperature resistance improves • resilience increases • hysteresis properties improve

For full technical information on Paracril, send for our 28-page booklet describing in detail the uses, compounding, and processing of this unusual chemical rubber.

Naugatuck Chemical, 1012 Elm St., Naugatuck, Conn.

Please send me your valuable 28-page booklet, "Paracril — Characteristics and Compounding"

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

Naugatuck Chemical

Division of United States Rubber Company

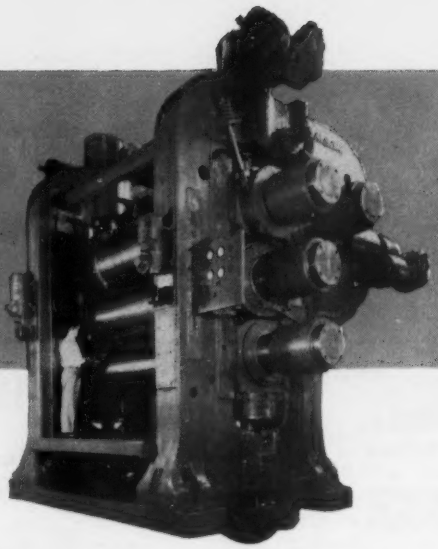
NAUGATUCK, CONNECTICUT

IN CANADA: NAUGATUCK CHEMICALS DIVISION • Dominion Rubber Company, Limited, Elmira, Ontario

Rubber Chemicals • Aromatics • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices

CALENDERS

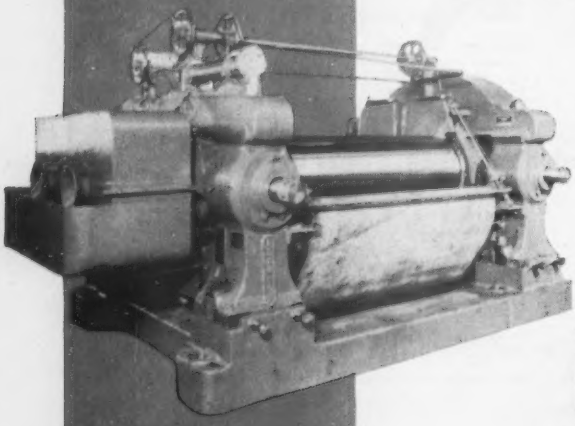
We make all types and sizes of Calenders, precision designed for extremely close tolerances to meet the most exacting requirements in the production of plastics film or the coating of fabrics with rubber or plastics. The unit shown is an ADAMSON UNITED 32″ x 92″, 4-Roll Plastics Calender geared to produce 72″ wide vinyl film, 2 mils. or less in thickness at speeds to 150 YPM.



RUBBER and PLASTICS —

... designed and built by...

We engineer and build all types of individual production units and complete electronically controlled trains with all accessories for every Rubber or Plastics processing requirement. Our highly specialized engineering and production facilities plus the combined research and technical abilities of United Engineering and Foundry Company, and the manufacturing capacity of eight modern plants, are at your service.

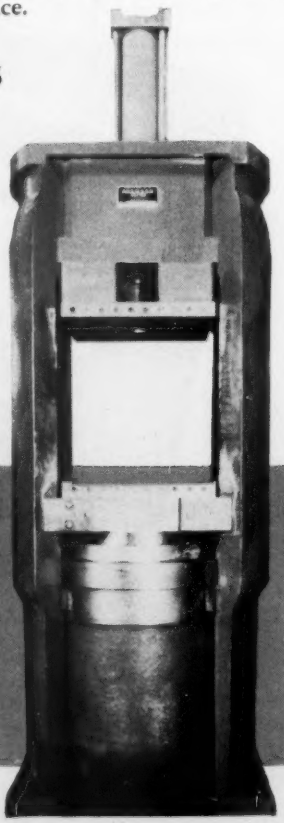


MILLS

An 84″ Individual Mill equipped with a mixing apron. ADAMSON UNITED Mills may be had in all sizes from 6″ x 16″ to 28″ x 84″, driven individually; in pairs with right angle reducer between the units, or grouped on a line shaft with reducer at one end of the shaft. Apron, as shown, can be installed on any type of existing mill. New catalog No. 463 on request.

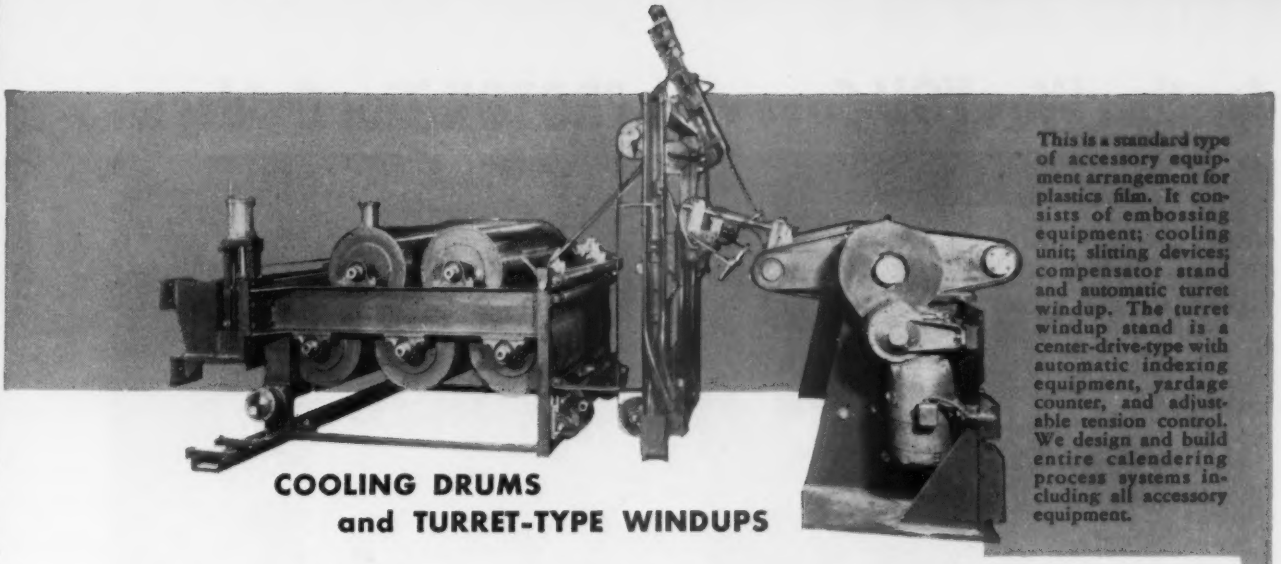
PRESSES

We build all types of presses for the rubber, plastics and plywood industries. Shown is a new 24″ ADAMSON UNITED BARREL TYPE PRESS with transfer cylinder. This new press, an exclusive ADAMSON UNITED development, exerts up to 76% more platen pressure than conventional types without change in present hydraulic lines. Stock is transferred into the mold cavities through sprues which reduces cure time and flash trimming to a minimum. Sizes range from 12″ through 32″ with larger sizes available to specification. Presses Catalog No. 462 on request.



AUTOCLAVES or VULCANIZERS

Built to specific requirements from 18 inches to 15 feet in diameter, any length, vertical or horizontal to withstand internal pressures as high as 1000 lbs.-per-square-inch. The Pot Heater shown is a vertical, cylinder-operated Breech-door type. Write for Vulcanizer Catalog No. 461.



COOLING DRUMS and TURRET-TYPE WINDUPS

This is a standard type of accessory equipment arrangement for plastics film. It consists of embossing equipment; cooling unit; slitting devices; compensator stand and automatic turret windup. The turret windup stand is a center-drive-type with automatic indexing equipment, yardage counter, and adjustable tension control. We design and build entire calendering process systems including all accessory equipment.

— PRODUCTION UNITS

..... ADAMSON UNITED

BRAKE and TIRE TESTING MACHINES

Installation shows an 84" Adamson United High-Speed Jet Airplane Brake and Tire Testing Machine of the inertia type. We have built similar machines as large as 16 feet in diameter for speeds up to 250 M.P.H. and tire loads to 150,000 pounds.

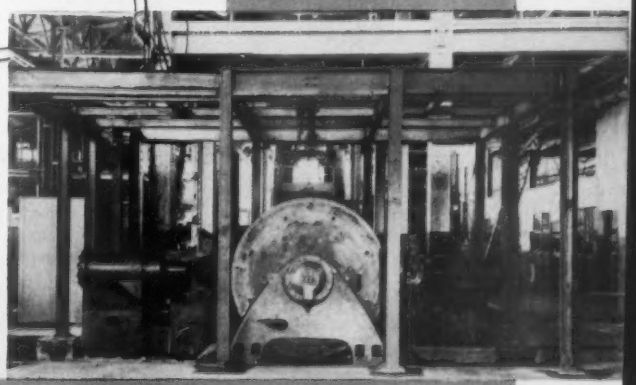
Wire, phone or write us today. No obligation.

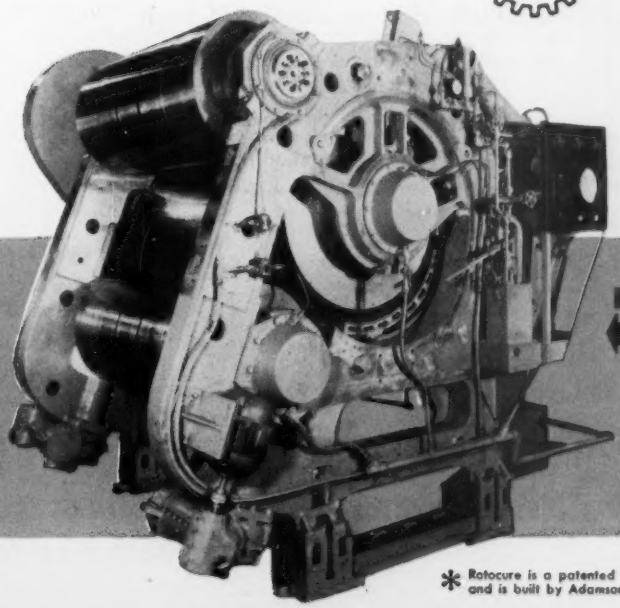
ADAMSON UNITED COMPANY

730 CARROL STREET • AKRON 4, OHIO

SALES OFFICES IN PRINCIPAL CITIES

Subsidiary of United Engineering and Foundry Company





ROTOCURE*

A new machine for the continuous curing of all flat rubber or plastics articles with smooth or designed surfaces. Rotocure increases production through continuous operation without opening, cooling, reheating and closing. It eliminates overcuring or undercuring of the over-lap areas occurring on conventional presses. Roll and belt changes, incident to design requirements, can be made on this new 60" x80" Rotocure in one-tenth the time formerly required.

* Rotocure is a patented development of Boston Woven Hose and Rubber Co. and is built by Adamson United Co. under a licensing arrangement.

Another Way *YOU* Save with PROTOX Zinc Oxides...

60 bags (1½ tons) of Protox-166 (left) make a compact, stable load. But a like amount of conventional zinc oxide packaged in the usual way (right) is unmanageable—must be cut to about 40 bags. Thus you haul as much in 2 loads of Protox-166 as in 3 loads of other oxides.

Cut Handling Costs Up to 33% with Protox

With Protox* Zinc Oxides you save up to a third of your handling costs compared with conventional zinc oxides.

You can load more Protox Zinc Oxide on your skids or pallets because:

1. Bags of Protox take up less space

a. The unique surface treatment on Protox reduces dry bulking

b. Our special method of packing Protox (as unit loads) likewise lowers the dry bulking

2. Bags of Protox are flatter

They stack tighter, ride better than conventional zinc oxides packaged in the usual way

If you use fork-lift trucks and can take advantage of our unusual method of unloading unit loads of Protox (#166, #167, #168, #169), you save even more on handling costs.

*U. S. Patents 2,303,329 and 2,303,330

THE NEW JERSEY ZINC COMPANY

Producers of Horse Head Zinc Pigments

... most used by rubber manufacturers since 1852

160 Front Street, New York 38, N. Y.

HORSE HEAD PRODUCTS

Expanded production facilities will triple Plasticizer production.

By mid-1953, Emery's revolutionary ozone oxidation process will greatly increase the availability of the Plastolein Plasticizers as well as exclusive Azelaic and Pelargonic Acids.

If you are not already using a Plastolein Plasticizer, start an evaluation today. Their lower costs will result in the increased use of certain of these products as basic vinyl plasticizers. Others will be very attractive as specialty plasticizers. All are noted for their low temperature properties, stability to heat and light, low water and oil extraction, low volatility, and excellent "hand" and drape.

Start an evaluation today. Write for samples . . . mail coupon for descriptive booklet.

PLASTOLEIN 9050 DHZ—(di-2-ethylbutyl azelate)—a highly-efficient specialty plasticizer for high clarity vinyl films, coated fabrics, extrusion compounds and other elastomers where low-temperature flexibility is essential. Excellent for non-thickening dispersions.

PLASTOLEIN 9058 DOZ—(di-2-ethylhexyl azelate)—a good all around basic plasticizer that also imparts excellent low temperature properties. Its outstanding combination of properties leads to its use in any vinyl product. Also advantageous for nitrile and GR-S rubbers.

PLASTOLEIN 9055 DGP—(diethylene glycol dipelargonate)—a general purpose auxiliary plasticizer for imparting low-temperature flexibility, excellent "hand" and drape to vinyls. Also, an outstanding low-temperature plasticizer for Neoprene and Buna-N rubbers.

PLASTOLEIN 9250 THFO—(Tetrahydrofurfuryl oleate)—a fatty type plasticizer of unusual stability, providing internal lubrication for superior processing. Also imparts excellent "hand" and drape to vinyl films and sheeting. Its relatively low cost makes it attractive for cellulosics, particularly nitrocellulose, and synthetic rubbers.

PLASTOLEIN 9715, 9720 POLYMERIC—These Polymeric Plasticizers impart extreme durability and weatherability to vinyl materials, yet exhibit the low-temperature characteristics and high efficiency of most monomeric plasticizers. Prolonged exposure to heat and ultraviolet light does not result in appreciable discoloration, stiffening, or sweat-out.

Emery

Fatty Acids & Derivatives
Plastolein Plasticizers
Twitchell Oils, Emulsifiers

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Warehouse stocks also in St. Louis, Buffalo, Baltimore and Los Angeles.

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Please send me your new book on Plastolein Plasticizers. My plant compounds: .....Vinyls.....Cellulosics.....Synthetic Rubber

Name.....Title.....

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DOW CORNING Mold Lubricants make easy release Automatic

Moe Muscles knows he's not a magician, but you can't blame him for taking some credit for the performance of Dow Corning Silicone mold release agents. Molded parts almost pop out of Dow Corning silicone treated molds, and he knows it. Release becomes a positive thing. It's more than freedom from sticking, even in molding heavily loaded stocks, heavy duty tires, precision moldings, or parts formed in complicated or deep cavity molds.

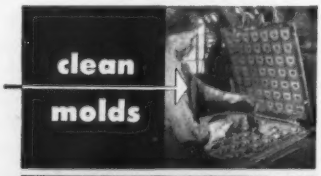
What's more, Inspector Mike can now be a pal instead of a stinker. Here's why. Unlike any other kind of mold lubricant, Dow Corning Silicones give easy release without build-up on the mold surfaces. Clean molds stay clean; scrap is reduced to the vanishing point; and you get top quality moldings with the kind of finish that sells to critical customers.

Dow Corning Silicones Mean Business!

For more information call our nearest branch office or write for data sheet CM-24

DOW CORNING CORPORATION
MIDLAND, MICHIGAN

For Easier Release and Better Quality
SPECIFY
DOW CORNING SILICONE MOLD RELEASE AGENTS
EMULSIONS for molds and curing bags; MOLD RELEASE FLUID in solvent solution for green carcass, bead and parting line release.



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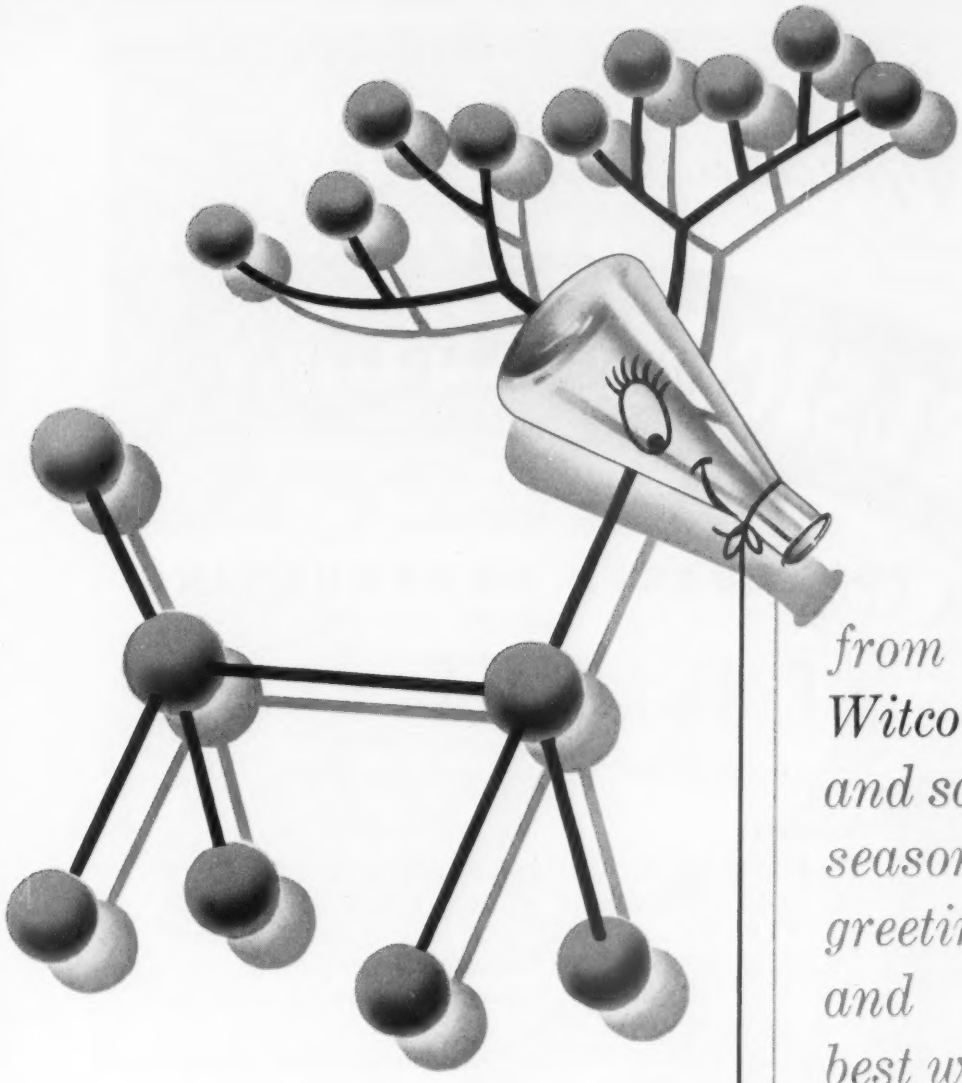

from
Witco's plants
and sales offices,
season's
greetings
and
best wishes
for the
new year

WITCO CHEMICAL COMPANY
CONTINENTAL CARBON COMPANY
295 MADISON AVENUE, NEW YORK 17, N. Y.

LOS ANGELES • BOSTON • CHICAGO • HOUSTON
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applications of

VELSICOL RESINS

FOR RUBBER COMPOUNDING

GE-9—AB11-4—AB11-2

some suggested applications:

- MECHANICAL GOODS
- ELECTRICAL INSULATION COMPOUNDS
- RUBBER SHOE SOLES AND HEELS
- RUBBER FLOOR TILING
- GASKETS AND JAR RINGS
- RUBBER ADHESIVES AND CEMENTS
- MOLDED RUBBER PRODUCTS
- TUBULAR COMPOUNDS
- RECLAIMED RUBBER
- SHEETING
- COLORED RUBBER STOCKS
- BATTERY CASES
- HARD RUBBER COMPOUNDS

features:

1. THERMOPLASTIC HYDROCARBON RESINS.
2. COMPATIBLE WITH NATURAL AND SYNTHETIC RUBBERS.
3. EFFECTIVE PLASTICIZERS AND SOFTENERS... in highly-loaded clay stocks or in recipes incorporating carbon black.
4. MILL READILY.
5. EXCELLENT DISPERSING AGENTS FOR FILLERS AND PIGMENTS.
6. FACILITATE PROCESSING PROCEDURES . . . impart excellent milling, calendering processing and tubing characteristics to stocks.
7. IMPART EXCELLENT PERFORMANCE CHARACTERISTICS . . . such as good tensile strength, elongation and modulus, as well as good resistance to abrasion and aging.
8. POSSESS HIGH ELECTRICAL RESISTANCE PROPERTIES.
9. AID IN THE DEVELOPMENT OF NON-SCORCHY STOCKS... without excessive retardation of cure at high temperatures.

For additional information concerning properties and applications of Velsicol Resins, write:

VELSICOL CORPORATION

GENERAL OFFICES AND LABORATORIES
330 E. GRAND AVE.
CHICAGO 11, ILL.

offices in principal cities

EXPORT DIVISION
100 EAST 42nd ST.
NEW YORK, N. Y.

WIRE INSULATING EXTRUDERS

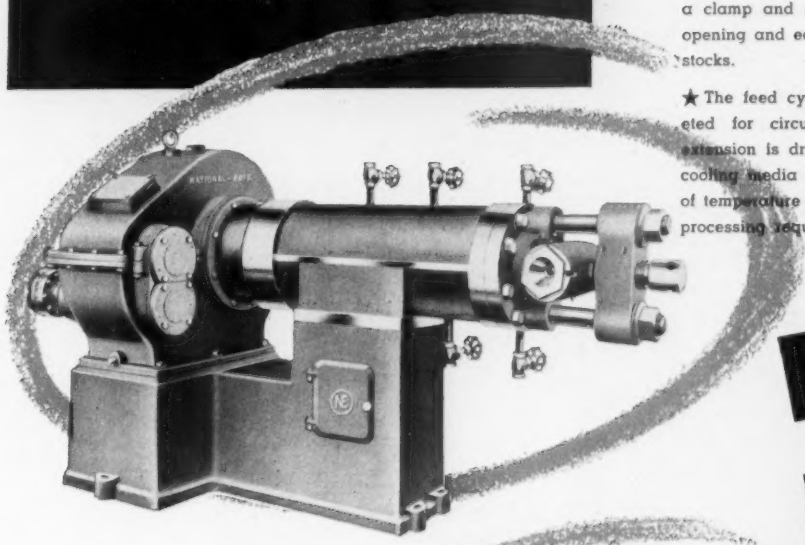
The National Erie extruder has been developed, after years of experience in design and use, into a machine with outstanding production features:

★ Drive gearing with precision cut gears and heavy duty thrust bearings of ample capacity have proved the superiority of National Erie design through years of trouble-free operation.

★ Anti-corrosive abrasion resistant cylinder liners and Stellite tipped screws insure long life.

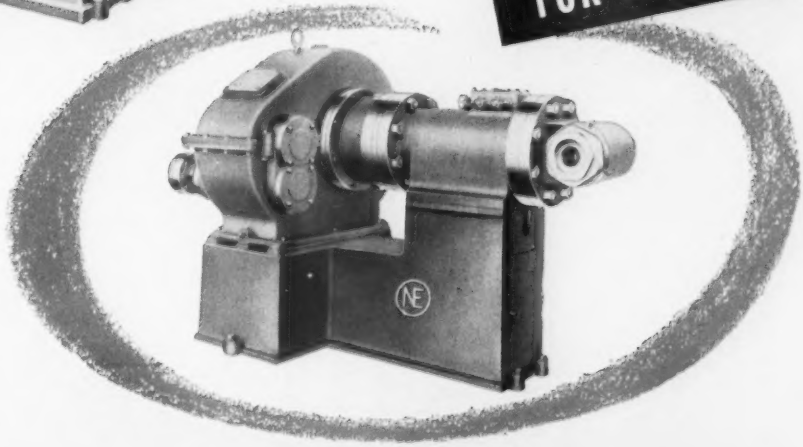
★ The plastics insulating extruder is equipped with a clamp and swing type head which permits quick opening and easy access for cleaning when changing stocks.

★ The feed cylinder on the plastics machine is jacketed for circulation of water and each cylinder extension is drilled for circulation of the heating and cooling media for zone temperature control. A choice of temperature control systems is available to suit the processing requirements of any material.



FOR PLASTICS

FOR RUBBER



A typical 4½" plastics insulating machine is illustrated above. A typical 3½" rubber insulating machine is illustrated at the right. Both of these machines are available in sizes 1½", 2½", 3½", 4½" and 6". Other sizes available as special designs.

NATIONAL ERIE STAFF JOINS HALE AND KULLGREN, INC.

The engineering organization of National Erie, including personnel, drawings and records, have transferred to the offices of Hale and Kullgren, Inc., at 613 East Tallmadge Avenue, Akron, Ohio, and are available to you for prompt service on your processing problems. Complete service on parts and information for all existing National Erie equipment is available.

Complete service on National Erie equipment

SALES • ENGINEERING • MANUFACTURING

HALE AND KULLGREN INCORPORATED

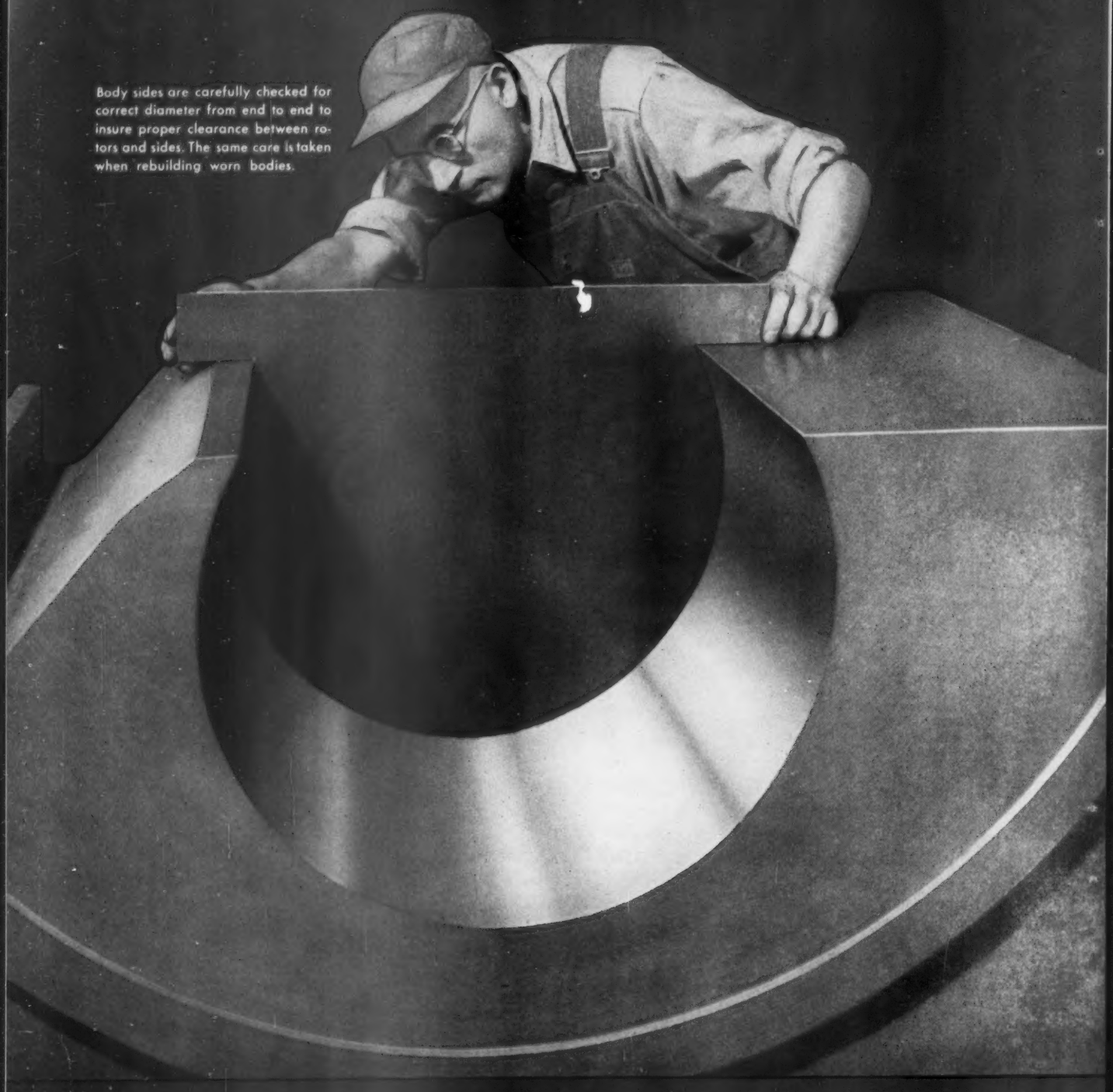
P. O. BOX 1231 • AKRON, OHIO

Aetna-Standard

THE AETNA-STANDARD ENGINEERING CO.
PITTSBURGH, PA.

Plants in Warren, Ohio
Ellwood City, Penna.

WHEN FARREL-BIRMINGHAM



Body sides are carefully checked for correct diameter from end to end to insure proper clearance between rotors and sides. The same care is taken when rebuilding worn bodies.

Farrel-Birmingham®

REBUILDS YOUR BANBURY MIXER

you get:

QUICK SERVICE
A MATCHLESS JOB
A NEW-MACHINE GUARANTEE

QUICK SERVICE—One reason why we can give you such quick service on your Banbury repairs is because we carry in stock over one million dollars worth of standard parts and complete new bodies. A second reason is that, when it comes to rebuilding worn parts, no time is lost in figuring out original sizes and contours. These dimensions are all shown on drawings we have in our files.

A MATCHLESS JOB—As the sole manufacturer of Banbury mixers for thirty-six years, ours is the only company with the complete knowledge and facilities required to restore one of these machines to its original work capacity. Furthermore, at Farrel-Birmingham, Banburys are constantly being improved in design and materials to meet the more severe, present-day, service requirements. We can incorporate these improvements in your rebuilt machines.

A NEW-MACHINE GUARANTEE—Banbury mixers rebuilt by us carry exactly the same guarantee as new machines. Such a guarantee by the original manufacturer provides assurance that your rebuilt machine will be "as good as new" when it is returned to service.

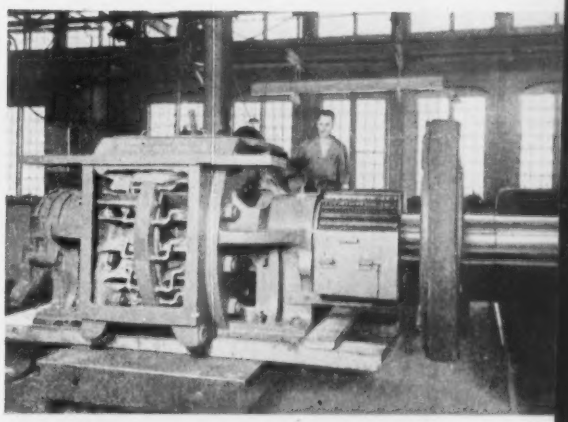
WHAT ABOUT COSTS? Do not be fooled by the low prices or exaggerated claims made by some repair shops. The high quality of our repair work cannot be matched at lower prices. New parts are priced fairly; suitable allowances are made for old parts taken in trade.

FREE INSPECTION SERVICE—A complete and competent inspection service, by factory-trained mechanics, is available to you at any time. A letter, phone call or wire to one of the offices listed below will bring an inspector to your plant anywhere in the United States, promptly and without cost to you.

FARREL-BIRMINGHAM COMPANY, INC.

ANSONIA, CONN. (Telephone Ansonia 4-3331)

AKRON, OHIO, 2710 First National Tower (Tel. Jefferson 3149)
CHICAGO, ILLINOIS, 120 So. La Salle Street (Tel. Andover 3-6434)
LOS ANGELES, CALIF., 2032 Santa Fe Avenue (Tel. Lafayette 3017)
HOUSTON, TEXAS, 860-A M&M Building (Tel. Preston 4472)

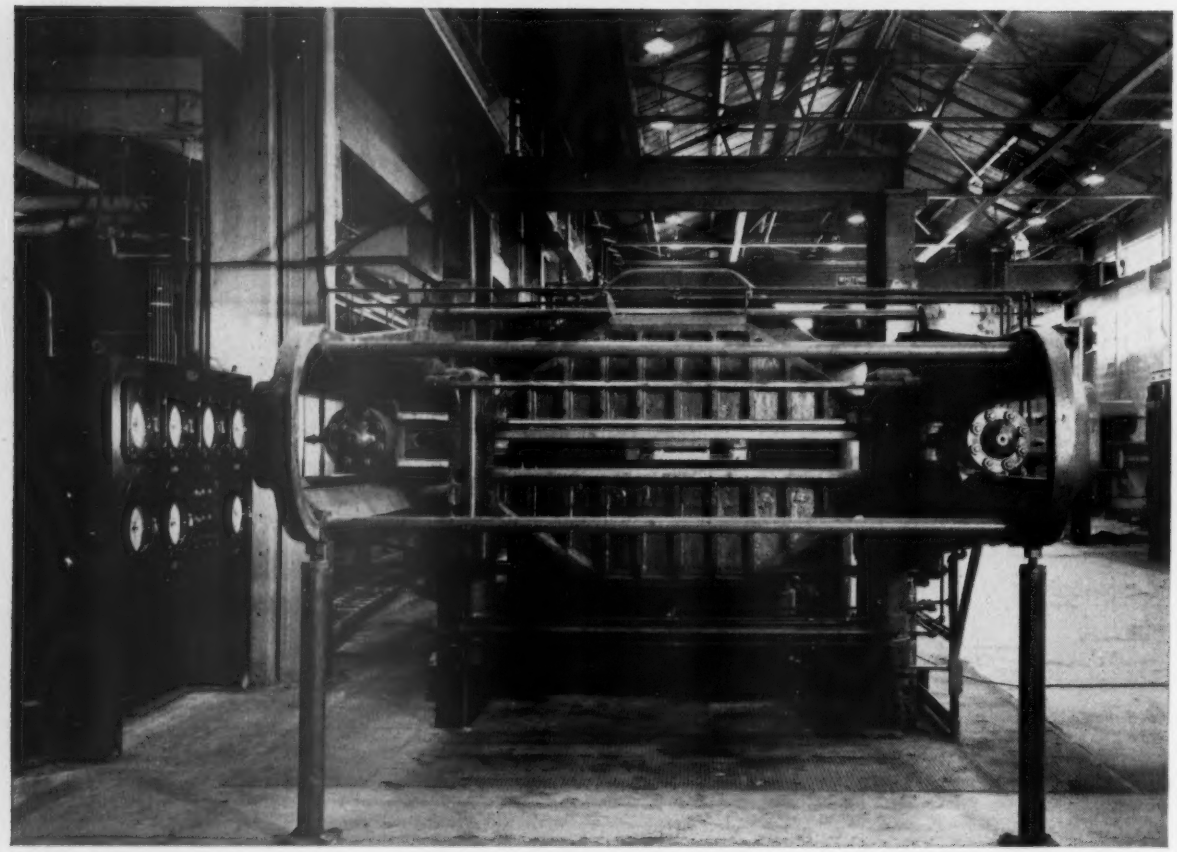


● Rebuilt Banbury body ready for shipment. Only Farrel-Birmingham has complete jigs, fixtures and gauges essential to restore Banbury parts to their original sizes, contour and efficiency.

● Hundreds of rotors are in stock at our Derby plant.

● Welded steel sides for size 11 Banburys. Complete rebuilt bodies are sometimes available.

BIG BELT...TINY WASTE!



THIS 78" x 35' 8" Belt Press, made by Farrel-Birmingham Company, Inc., and installed in the Buffalo plant of Hewitt-Robins, Inc., is one of the biggest at present in operation in the U.S.A.

Hewitt-Robins have been using Taylor instruments to control temperature and timing of the cure of their vulcanizing presses for many years. Here's what happens on this mammoth press: Taylor Fulscope* Controllers **control the steam heating of the platens and the condensate, the cooling of the platens, the temperature of the water-cooled ends and the duration of the cure.**

At the end of each heat the platen temperature is cooled only to just below the point where it might be harmful to the product; result—considerable savings of steam and treated water. "We get three major benefits from this Taylor instrumentation," says Hewitt-Robins' Production Manager: **"an accurate record of what's being done . . . an accurate record of the duration of the cure . . . rapid response of the press, in temperature come-up and cool-down."**

Ask your Taylor Field Engineer how you can save waste and protect product quality on belt presses, mechanical rubber products presses, tire and tube presses, horizontal or vertical vulcanizers—just about any type of rubber curing process. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

• • •

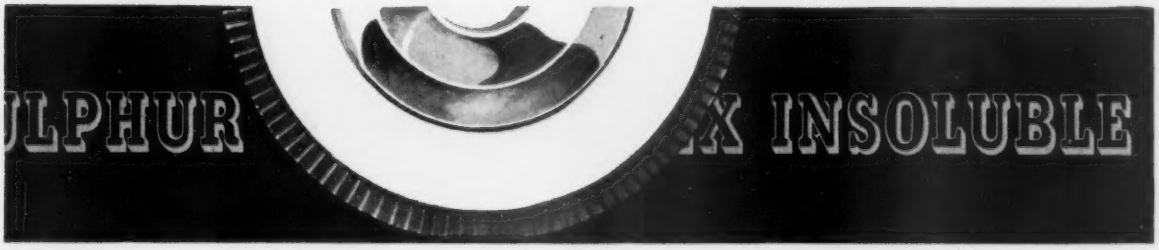
Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

*Reg. Trade-Mark

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

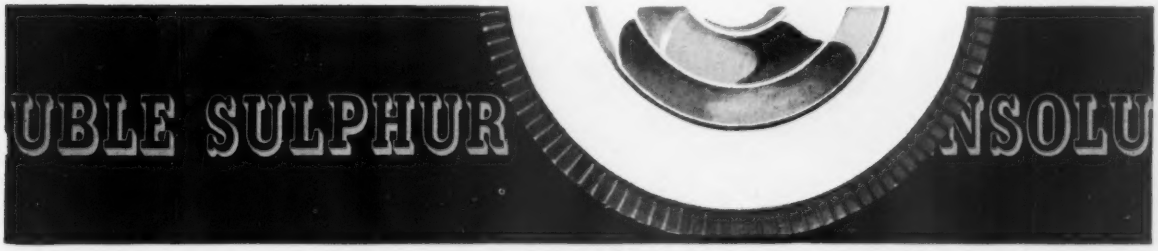
. . . THE DIFFERENCE IS IN THE

INSOLUBLE SULPHUR CONTENT



When you buy CRYSTEX Insoluble Sulphur you can be sure of receiving *at least* 85% insoluble sulphur. For quality products — such as white side wall tires — you can save yourself many production headaches by using *the* quality insoluble sulphur.

CRYSTEX, with its uniformly high insoluble sulphur content, practically eliminates stains and off-color caused by sulphur bloom. CRYSTEX can be used advantageously in tire carcass stocks, white sidewall tires, tube stocks, repair stocks, mechanicals, naphtha cements, latex dispersions, reclaim stocks and bin stocks. Write for a copy of the CRYSTEX Insoluble Sulphur circular.



OTHER STAUFFER RUBBERMAKERS' CHEMICALS

Commercial Rubbermakers' Sulphur, Tire Brand, 99½% Pure
Refined Rubbermakers' Sulphur, Tube Brand
"Conditioned" Rubbermakers' Sulphur
Flowers of Sulphur, (30% Insoluble in CS_2)

CARBON TETRACHLORIDE
CARBON BISULPHIDE
CAUSTIC SODA
SULPHUR CHLORIDES
BORAX

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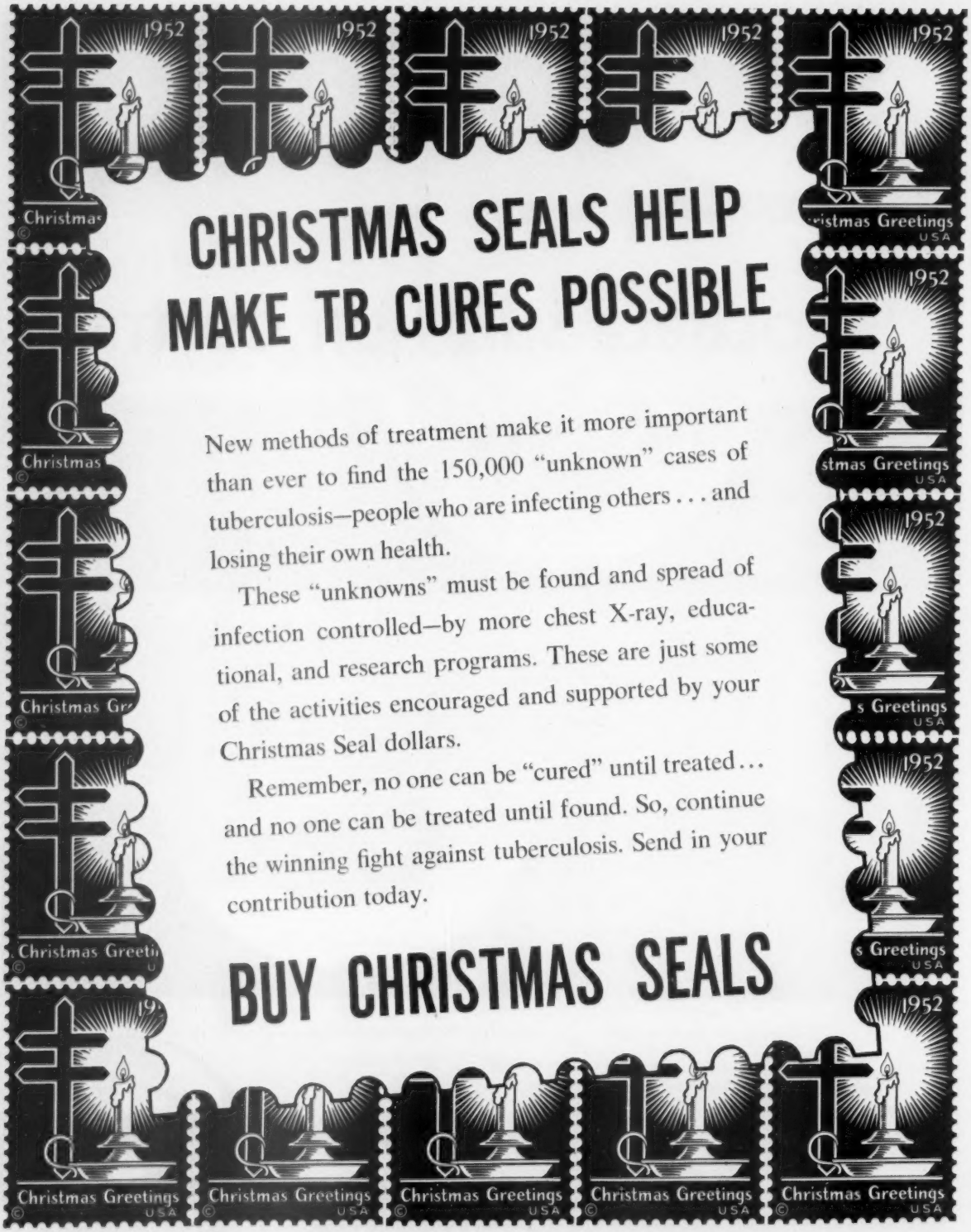

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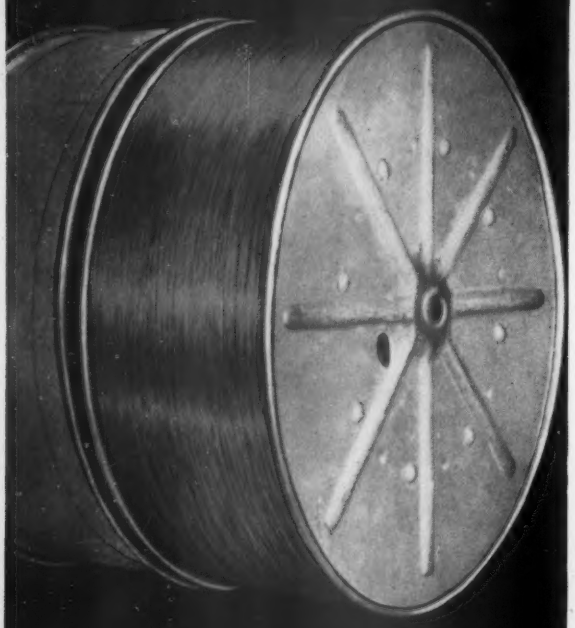

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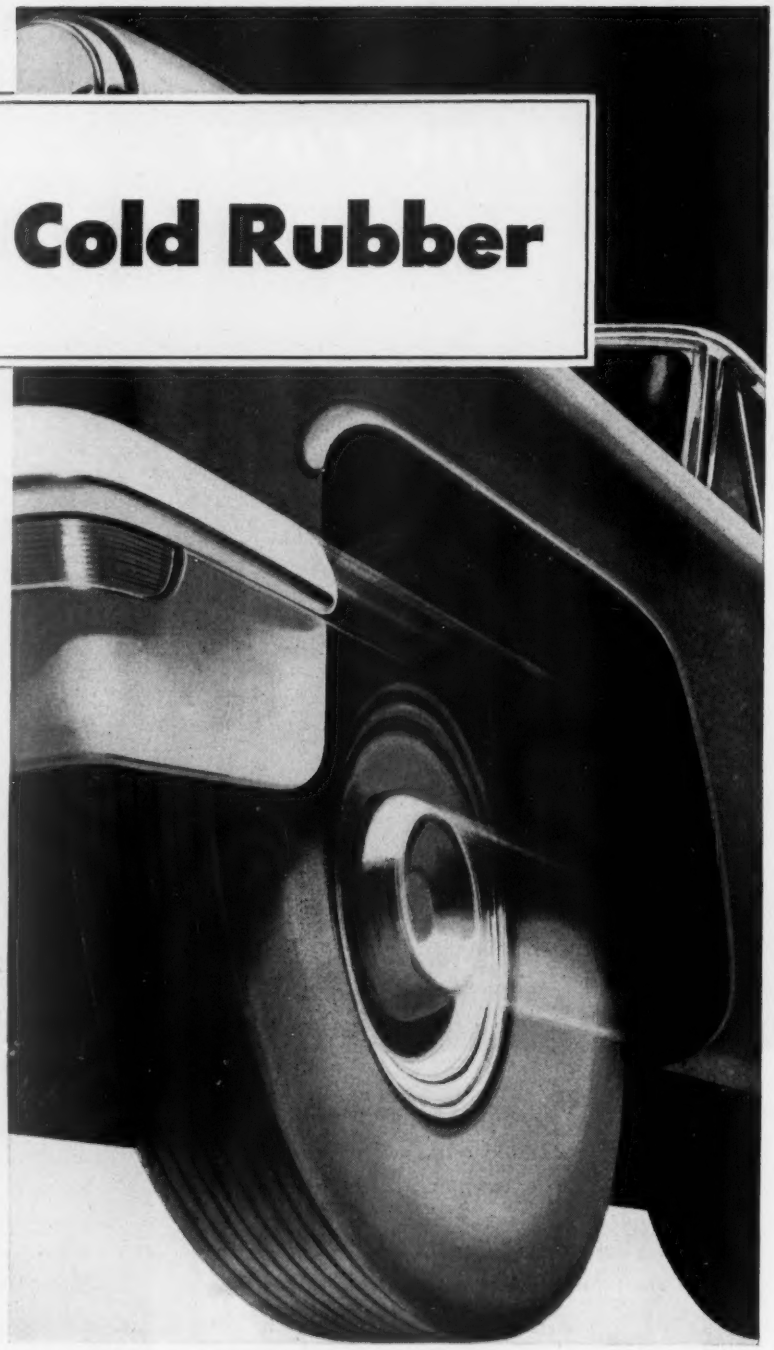

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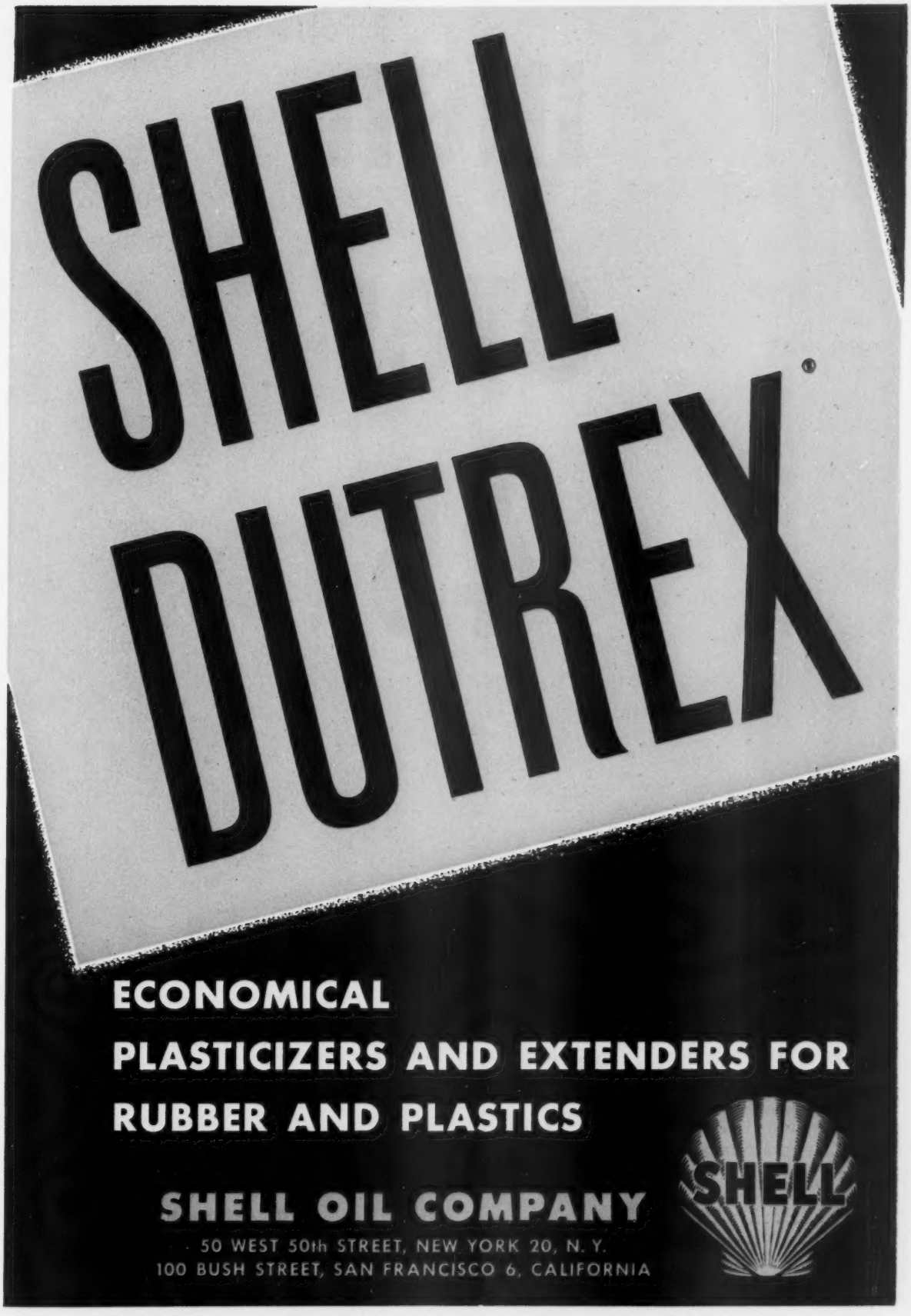
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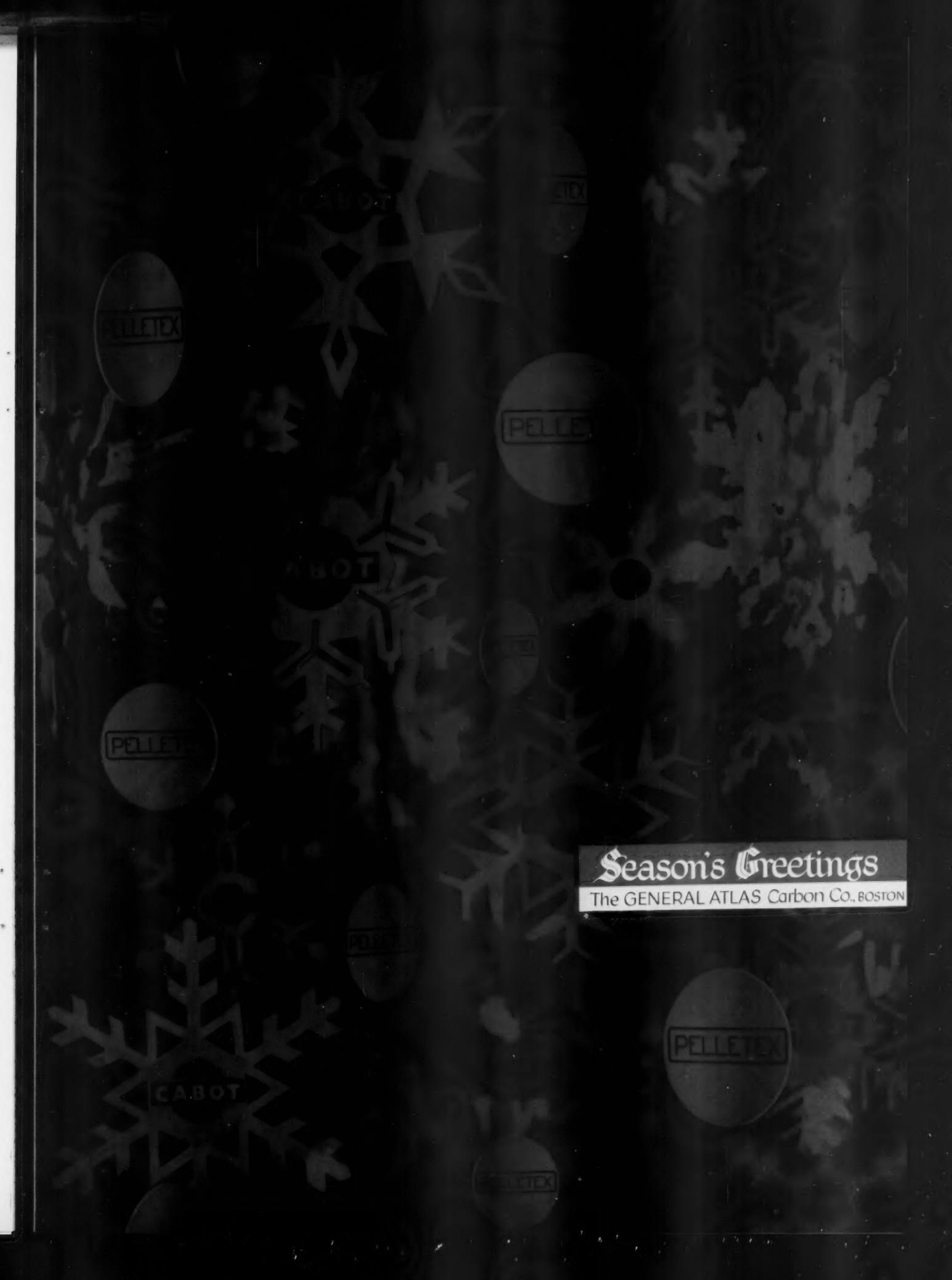
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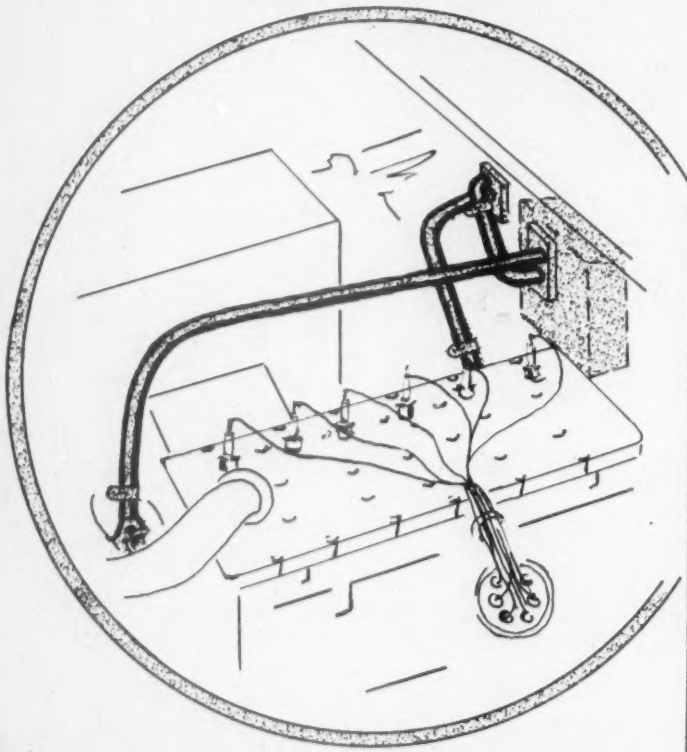

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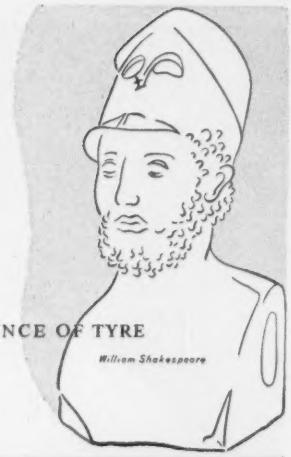

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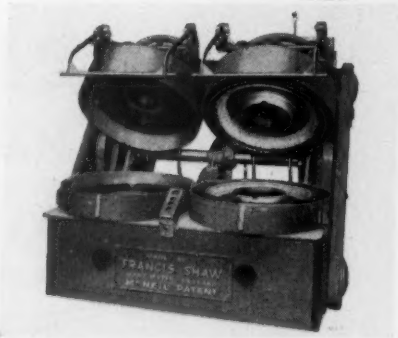

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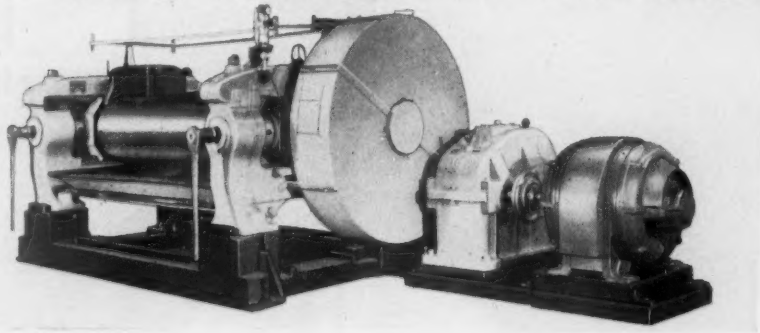

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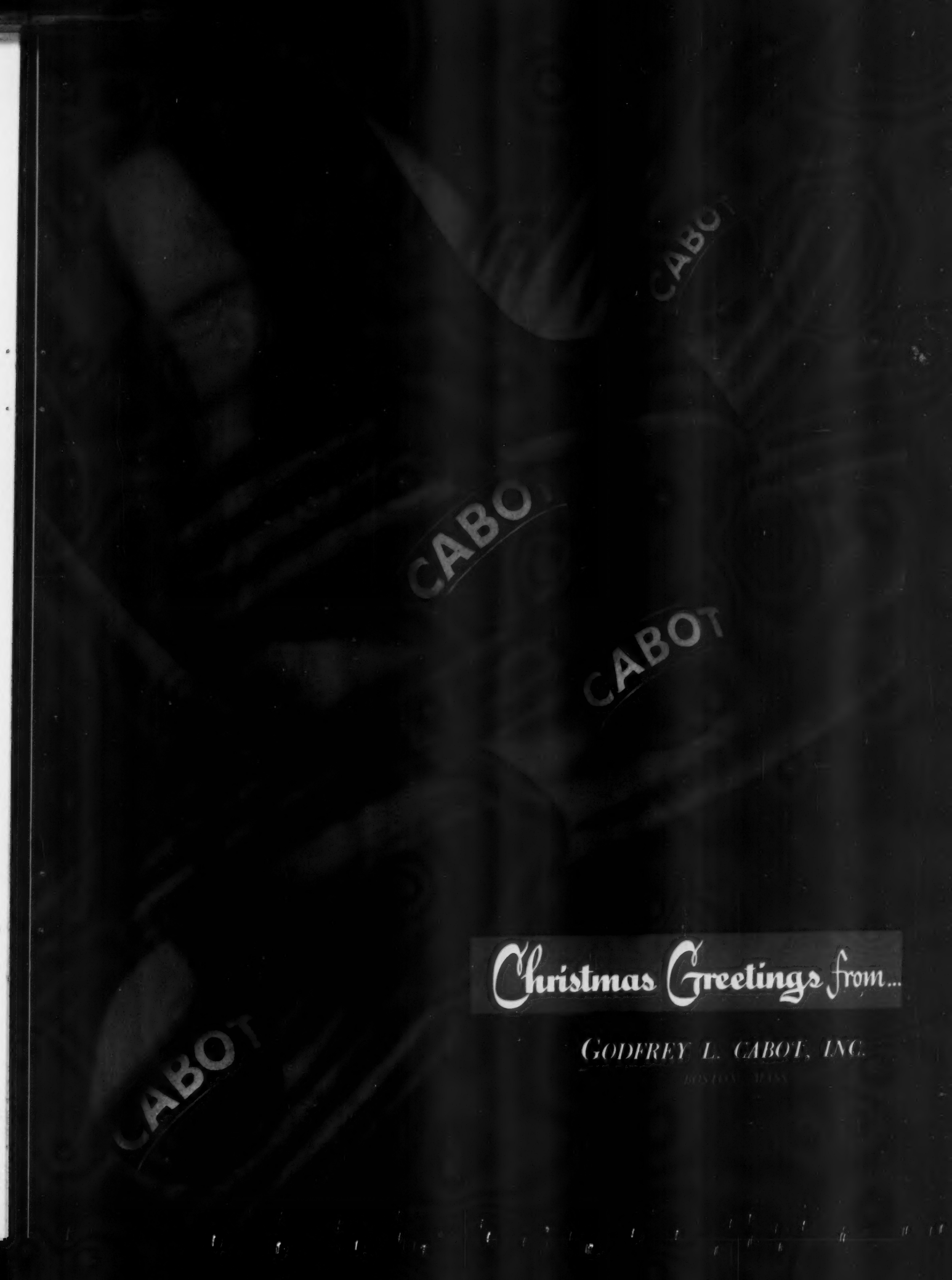

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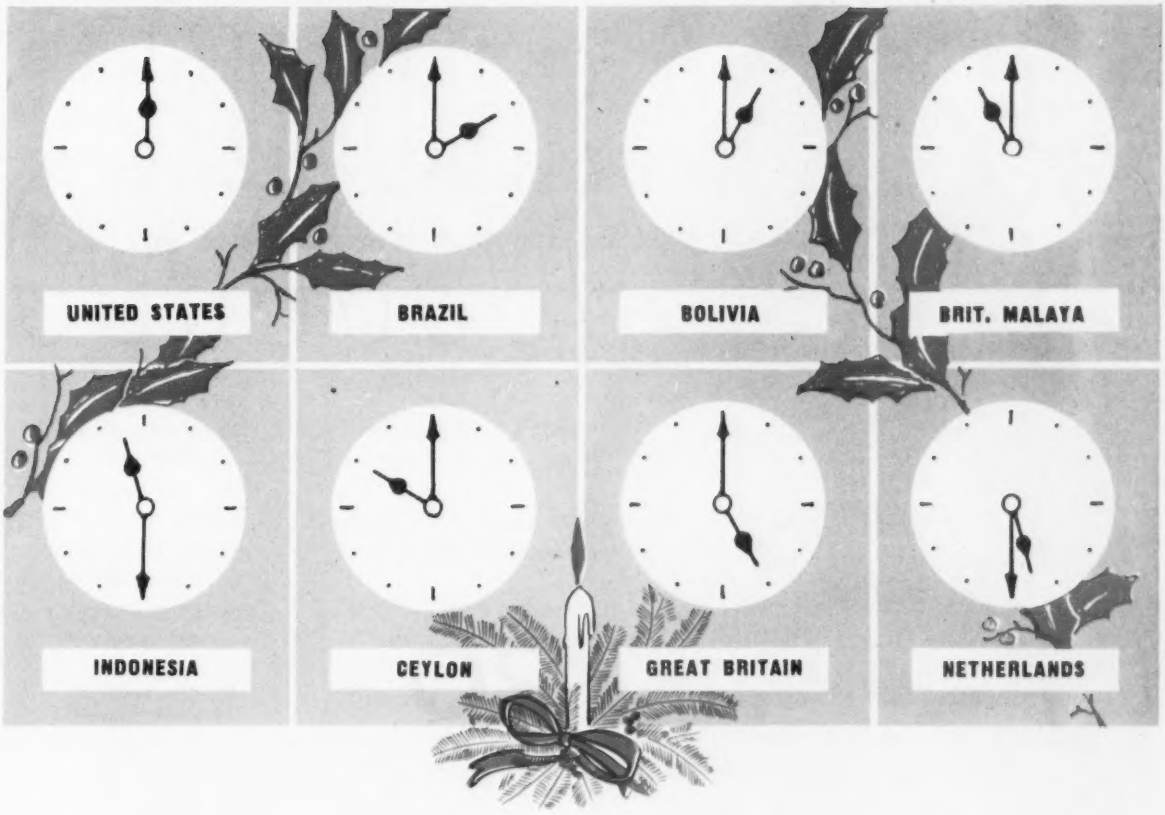

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CONTENTS FOR DECEMBER, 1952

Compounding Plastisols for Specific Applications—*By C. A. Clark and H. E. Connors* 343

Beta-Ray Gaging in the Rubber Industry—*By R. T. Stacy and S. Bernstein* 350

Pilot Plant Production of Lactoprene EV—*By W. W. Howerton, T. J. Dietz, A. D. Snyder and G. E. Alden* 353

Flexible Rubber Bags Finding Application in Medical Field 362

•

REGULAR DEPARTMENTS

Book Reviews	396	Los Angeles News	390
Canadian News	386	Names in the News	381
Chemical Prices	406	New Equipment	392
Classified Ads	415	New Goods	385
Coming Events	373	Obituaries	388
Editorials	363	Rubber, Cotton Markets	404
Financial News	378	Statistics	*

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RUBBER AGE

Vol. 72, No. 3 DECEMBER, 1952

Compounding Plastisols for Specific Applications

By C. A. CLARK and H. E. CONNORS

B. F. Goodrich Chemical Co., Cleveland 15, Ohio

SINCE the commercial introduction in 1947 of types of polyvinyl chloride resin adapted for use in the preparation of low viscosity, high solids paste dispersions by simple stir-in methods, the number and variety of applications for paste systems has increased remarkably *(1, 2, 10)*. The almost unlimited adaptability of paste systems has resulted in their use in processes requiring highly fluid as well as extremely viscous compounds. Pastes containing no volatile components are known as plastisols, whereas those in which volatile organic liquids are added by stirring are known as stir-in organosols or, less frequently, modified plastisols. The term "plastigel" has recently been applied to a type of plastisol in which plasticizer gellation agents have been added. Dispersions of resins in non-organic liquids are not considered in this paper.

Compounding of polyvinyl chloride resins has been reviewed by Zimmerman and Weaver *(3)*. Articles dealing specifically with compounding and applications of polyvinyl chloride plastisols and organosols have also appeared *(4, 5, 6, 10)*

Recently, Todd *(7)* has presented a great deal of information on the rheological characteristics of the normally non-Newtonian plastisol compounds for various applications and the effect of composition on flow properties. It is the purpose of this article to combine the approach of Todd with that of Zimmerman and Weaver in an examination of typical plastisol and high solids stir-in organosol compounds for a number of different applications.

The compounder of stir-in paste compounds is faced with all the usual problems of compatibility, stability, and cost which face the formulator of conventional vinyl compounds. In addition, however, he must balance and compromise with another variable—compound viscosity and flow. Despite the complexity of the problem, accumulation of knowledge has been so rapid that today there are few limits to the results obtainable by the stir-in paste technique. Commercial applications have been found for paste compounds ranging all the way from 6 to over 95 in Durometer A hardness.

Although processing methods are beyond the scope of the article, it may be helpful to point out that all the compounds to be presented are designed for preparation in mixing equipment such as change-cans, pony, Hobart, and internal. In most cases, grinding equipment is only necessary for preparation of pigment and stabilizer masterbatches in plasticizer.

The prepared compounds are generally designed for application and fusion at atmospheric pressure, although unicellular plastisol sponge is an exception. Knife and roll spreading, pouring, dipping, and low pressure injection or pressing are the usual application methods. In almost all cases the compound must be heated to a fusion temperature of 350° F. or over after application in order to achieve a tough, coherent product. If the

TABLE I—PLASTICIZERS IN PLASTISOLS
(Recipe: Geon Resin 121, 100; Plasticizer, 65)

Initial Viscosity (cp.)		Viscosity after Two Week Aging (cp.)
Trioctyl Phosphate (1000 cp.)†	lowest viscosity	Trioctyl Phosphate (1300 cp.)†
Dioctyl Sebacate	2	Dioctyl Sebacate
Dioctyl Adipate	3	Dicapryl Phthalate
Dicapryl Phthalate	4	Tetrahydrofurfuryl Oleate*
Trixylenyl Phosphate*	5	Dioctyl Adipate
Octyl Diphenyl Phosphate	6	Dioctyl Phthalate
Acetyl Tributyl Citrate	7	Hydrogenated Terphenyl*
Tetrahydrofurfuryl Oleate*	8	Tricresyl Phosphate*
Butyl Benzyl Phthalate	9	Trixylenyl Phosphate*
Polymeric (medium viscosity)*	10	Acetyl Tributyl Citrate
Dioctyl Phthalate	11	Petroleum Base Plasticizer*
Hydrogenated Terphenyl*	12	Octyl Diphenyl Phosphate
Petroleum Base Plasticizer*	13	Chlorinated Paraffin 40%*
Tricresyl Phosphate*	14	Polymeric (medium viscosity)*
Chlorinated Paraffin 40% (11300 cp.)*	highest viscosity	Butyl Benzyl Phthalate (22000 cp.)†

* Evaluated as secondary plasticizers in standard recipe as 25% of plasticizer-75% DOP. † Falling cylinder viscometer (*4*).

compound contains volatile ingredients, a controlled heat-up period must be used for proper evaporation, but a 100% solids compound may be heated at the maximum possible rate. Methods of drying and fusion include hot air, radiant heat, dielectric heat, and immersion.

COMPOUNDING INGREDIENTS

The effect of many types of compounding ingredients on the flow properties of polyvinyl chloride high solids paste systems has been studied. On the basis of this data, predictions can be made as to the flow properties of the complete system (*7*). Since it is probable that the reader is already somewhat familiar with vinyl compounding, the following discussion of specific ingredients will emphasize particularly their individual effects on viscosity and flow properties.

Plasticizers

The phthalate esters, particularly dioctyl phthalate, are the most widely used general purpose plasticizers for polyvinyl chloride pastes. Adipate and sebacate esters (again principally the dioctyl type) are important for low temperature flexibility and their tendency to give low viscosity pastes. Octyl diphenyl phosphate is of importance where non-toxicity or flame resistance is required and trioctyl phosphate is used to combine good low temperature properties with flame resistance.

Tricresyl phosphate is not widely used in paste systems because of the high viscosity and dilatancy it imparts, but where difficult flame resistance requirements must be met, it is sometimes mixed with low viscosity types. Certain of the less viscous polymeric type plasticizers are helpful in reducing volatility and improving chemical and solvent resistance. Most of the other commercially available low viscosity primary and secondary plasticizers are used in paste systems as in conventional vinyl compounding.

Plastisol viscosity, measured immediately after compound preparation, is directly related to the viscosity of the plasticizer or plasticizer blend used. On aging, however, the relative solvent power of the plasticizers determines the viscosity range of the compound. The effect of a number of materials and blends is shown in Table I.

Stabilizers

Processing requirements for the preparation and application of paste systems are such that the heat history is generally not as severe as with mill mixed compounds and thus lower levels of heat stabilization can usually be used. Some degree of heat stabilization is always recommended, however, and stabilization to heat and light under service conditions must be taken into account.

Stabilizers have a measurable but usually not a significant effect on paste flow properties. For this reason, they are chosen primarily for the intended processing and service conditions so long as they are compatible in the paste system. Lead salts, barium cadmium, calcium, strontium soaps, organic tin compounds, organic phosphates, and epoxy compounds are commonly used in paste systems. Each type has particular characteristics which must be well understood for advantageous use. Stabilizers are usually added to the paste system along with the plasticizers. If they are not soluble in the plasticizers, they are preferably preground in a high viscosity plasticizer on a three-roll mill or colloid mill.

Some of the chemical forms of stabilizers that are commonly used in vinyl paste dispersions are shown in Table II. The primary function of each type is indicated.

TABLE II—STABILIZERS FOR PASTE DISPERSIONS

Stabilizer	Form	Primary Function: Heat Stabilizer	Primary Function: Light Stabilizer	Compound (3 PHR*)
Tribasic Lead Sulfate	solid	X		translucent
Dibasic Lead Phosphite	solid	X	X	opaque
Dibasic Lead Phthalate	solid	X		translucent
Organic Phosphate	solid	X	X	transparent
Organic Tin Compound	liquid	X		transparent
Barium Ricinoleate	solid & liquid	X		transparent

* Parts per 100 parts resin.

Fillers

Cost reduction is generally the prime function of fillers in paste compounding. In some cases, however, they serve as a means of altering the flow properties or producing a flatted surface. Most commonly used are ground and precipitated calcium carbonates, barytes and calcined kaolin clays. Silicas, diatomaceous earths and micas serve special purposes. Fine particle size filler may be added dry during paste mixing. Coarse or diffi-

cultly dispersible fillers are normally preground in a portion of the plasticizer.

Where fluidity is desired at low plasticizer content or where the same goal is required for high filler content in compounds with definite hardness limitations, low oil absorption fillers are preferred.

High oil absorption fillers can be used in small amounts for the accomplishment of non-dripping flow properties in compounds designed for dip coating. In larger amounts, putty-like compounds result.

Table III shows the effect of some common fillers on plastisol flow properties. The amount of each filler used in this table is calculated for volume equivalence to 20 parts of a filler having a specific gravity of 2.6.

Volatile Diluents

Remarkable viscosity effects result from the addition of small amounts of hydrocarbons and ketones to plastisol compounds. This type of dispersion commonly carries the name "stir-in organosol" as differentiated from "organosol". The term "organosol" generally connotes that grinding by ball or ink mill is necessary for the preparation of smooth and stable dispersions.

Some of the flow property effects of chosen diluents in a simplified compound are shown in Table IV.

Color Pigments

The principles which have been outlined for the use of color pigments in conventional vinyl compounds *(3)* apply equally well to vinyl paste dispersions. In many cases the amounts of color pigments needed are so small as to enable the compounder to neglect their effect on flow properties. This is not the case where substantial quantities of pigment are present and when the oil absorption of the pigment is high. Typical satisfactory pigments are titanium dioxide, lithopone, B.O.N. red toners, cadmium reds, iron oxides, chrome oranges, yellows and greens, phthalocyanine greens and blues, and channel blacks. Pigments are usually preground in a portion of the plasticizer, but pigments designed for incorporation by simple stirring have been brought on the market.

The relatively small amount of mechanical working necessary for the preparation and use of stir-in vinyl pastes and the inherent fluidity of the paste systems facilitate the incorporation of a number of specialty pigments such as luminescent color and flaking aluminum powder.

Specialty Ingredients

Studies in compounding for specific application requirements have brought into prominence a number of materials used for special effects. Table V lists a number of these ingredients and a notation regarding their purpose in high solids vinyl dispersion technology.

Table III—Fillers for Plastisols

(Recipe: Geon Resin 121, 100; Dioctyl phthalate, 66; Filler, volume equivalent to 20 parts by weight of a filler having a specific gravity of 2.6)

Filler	Specific Gravity	Parts Used	Approx. Viscosity (cps.)* Initial	1 day	Oil Absorption No.†
Barytes	4.46	34.4	6,000	7,000	16
Precipitated calcium carbonate (low oil absorption)	2.71	20.9	11,000	18,000	36
Grey slate flour	2.8	21.6	15,000	25,000	30
Ground calcium carbonate (low oil absorption)	2.71	20.9	11,000	18,000	36
Silica	2.65	20.4	9,000	19,000	42
Calcium carbonate (high oil absorption)	2.65	20.4	35,000	40,000	45
Calcined kaolin clay	2.6	20	11,000	17,000	66
Water ground mica (352 mesh)	3.0	23.1	45,000	40,000	79
Diatomaceous	2.3	17.7	30,000	40,000	148

* Viscosity determined on Falling Cylinder Viscometer *(4)*.
† Gardner-Colman Method, using dioctyl phthalate.

APPLICATION COMPOUNDING

The foregoing presents some of the effects that various common vinyl compounding materials have in the field of vinyl dispersion technology. There are many other choices that can be made in each group and much of this information can be obtained from published literature and from raw material suppliers.

We will next consider some practical examples of compounds resulting from a choice of ingredients for specific applications. In this way we can see the general approach used in a systematic development of vinyl dispersion formulations. The principal factors concerned in most cases are:

(a) Lowest cost consistent with quality.
(b) Properties required in finished items.
(c) The processing method of application.

In addition certain specific requirements may exist. In the following examples these combined factors are considered for the establishment of starting point recipes suitable for initial development work and plant

Table IV—Flow Property Effects of Volatile Diluents

Stir-in Organosols Flow Properties, 25° C. Aged One Day
Precision Interchemical Rotational Viscometer
(Recipe: Geon Resin 121, 100; Dioctyl Phthalate, 60; Thinner, 7; 95.5% solids)

Thinner	Low Shear Visc. (cp.)	Yield Value (dynes/cm.²)	High Shear Visc. (cp.)
Control (no thinner)	9300	..	14,000
Mineral spirits (boiling range, 320°-385° F.)	1700	80	2100
High aromatic naptha (boiling range, 315°-350° F.)	3100	50	3600
Diisobutyl ketone	2800	50	3300

Table V—Specialty Ingredients and Their Purpose

Ingredient	Purpose
Aluminum stearate	Plasticizer gellation agent, increases viscosity and develops yield point in compound.
Organophilic bentonite	Organophilic material develops yield point and increases compound viscosity.
Complex organic hydrazide	Chemical blowing agent, generally nitrogen producing for vinyl sponge formation.
Lecithin	Effective in some compounds as a viscosity reducing agent when present in small quantities.

runs. In any processing plant, further adjustments may have to be made for the particular equipment involved.

Spread Coating (Knife)

Application

Red coated and embossed cotton sheeting for upholstery (4-8 ounce coating).

Desired Properties

1. Medium plastic viscosity (under 10,000 cps.) compound. Some dilatancy permissible, but preferably low. Yield value preferably low except where direct coating on porous sheeting is necessary.
2. Lowest cost consistent with quality.
3. Abrasion resistance.
4. Minimum stiffness under outdoor winter conditions.
5. Resistance to outdoor aging.
6. Resistance to lacquer lifting.

Starting Point Recipe

(Plastisol—100% Solids)

Geon 121 (PVC plastisol resin)	100
Dioctyl phthalate	35
Dioctyl adipate	20
Polymeric plasticizer (medium viscosity)	10
Hydrogenated terphenyl	10
Calcium carbonate (low oil absorption)	50
Titanium dioxide	5
Dibasic lead phosphite	3
B.O.N. type red (beta oxy naphthoic acid type)	1 to 2

Analysis

General—It is assumed that the above recipe will be the weight building coat or the top coat in a typical two or three coat system. As such, it is desirable to keep the plasticizer content to the lowest value compatible with low temperature flexibility and stiffness. By proper selection of plasticizers and fillers, operating viscosities can be reached at the desired plasticizer content with a 100% solids system.

Dioctyl phthalate—This general purpose primary plasticizer is added in sufficient amount to achieve the desired hardness and viscosity while maintaining quality.

Dioctyl adipate—Low viscosity and improved low temperature flexibility are obtained with dioctyl adipate.

Hydrogenated terphenyl—Used primarily to reduce cost. This secondary plasticizer will not harm stability or low temperature flexibility when used in the amount indicated.

Polymeric plasticizer—Aids in reducing lacquer lifting, but it is primarily included to afford a viscous grinding medium for the color, pigment, and stabilizer. Its relatively high viscosity will not be an important disadvantage in the quantity used.

Calcium carbonate—Primarily for cost reduction. The low oil absorption is advantageous in minimizing plasticizer requirement and its tendency to disperse readily in plastisols makes it possible in many cases to add it as a dry powder instead of as a ground dispersion in plasticizer.

Titanium dioxide—Used to obtain maximum hiding power with minimum amount of pigment.

Dibasic lead phosphite—An efficient heat and light stabilizer for opaque stocks. Also contributes to opacity.

Spread coating of plastisols, shown here on a laboratory scale, is used for producing cotton sheeting for upholstery among other applications.

Film Casting (Reverse Roll Coater)

Application

White, 2½ mil film for draperies to be transfer printed from casting paper, if desired.

Desired Properties

1. Low to medium plastic viscosity (under 6,000 cps.), with both yield point and viscosity preferably low.
2. Lowest cost consistent with quality.
3. Good hand and drape, non-tacky.
4. Flame resistance.
5. Tear resistance.
6. Resistance to yellowing, stiffening, and darkening with age.
7. Fair low temperature flexibility.

Starting Point Recipe

(Stir-in Organosol—91% Solids)

Geon 121 (PVC plastisol resin)	100
Octyl diphenyl phosphate	30
Dioctyl sebacate	12
Titanium dioxide	10
Antimony trioxide	5
Organic phosphate stabilizer	3
Mineral spirits (boiling range—320-385° F.)	10 or as required
Diisobutyl ketone	5 or as required

Analysis

General—Hand and drape characteristics and tear strength limit the amount of plasticizer which can be used. Thus, volatile diluents must be used to bring viscosity in the proper range. Economy requires that a minimum amount of diluent be employed.

Octyl diphenyl phosphate—A phosphate plasticizer is chosen principally for flame resistance and this particular one serves also as a satisfactory primary. Intermediate viscosity.

Dioctyl sebacate—The low volatility of this plasticizer aids the aging of thin film and its low viscosity characteristics in plastisols raises the possible total solids of the final compound. In addition, tear resistance is generally enhanced by the use of a plasticizer which imparts low temperature flexibility.

Titanium dioxide—See data under "Spread Coating."

Antimony trioxide—Provides good hiding power and adds to flame resistance of the finished film.

Stabilizer—Outstanding light stability and adequate heat stability (for the relatively mild processing conditions required) are provided by organic phosphate stabilizers. Lead stabilization is deliberately avoided because of the danger of darkening of the film in soft coal areas.

Mineral spirits—Reduces viscosity to casting consistency by dilution and flocculation. It evaporates during fusion.

Diisobutyl ketone—Acts as a fugitive plasticizer and thus aids in knitting the film during volatilization of the mineral spirits. Of equal importance in most cases is its dispersing action which offsets any tendency towards poor flow-out which the aliphatic diluent might cause through flocculation and build-up of yield point.

Slush Molding

Application

Lifelike slush-molded doll parts.

Desired Properties

1. Medium viscosity (below 10,000 centipoises)—ability to duplicate minute mold details.
2. "Lifelike feel" provided by soft stock.
3. Easy-to-clean vinyl properties.
4. Translucency.
5. Minimum migration or lifting when in contact with lacquer, varnish, and other common finishes.
6. High tear and tensile strengths, low 100% modulus.
7. Processing heat stability and resistance to light exposure during use.

Starting Point Recipe

(Plastisol—100% Solids)

Geon 121 (PVC plastisol resin)	80
Geon 202 (copolymer resin)	20
Dioctyl phthalate	50
Polymeric plasticizer (medium viscosity)	50
Calcium carbonate (low oil absorption)	10
Organic phosphate stabilizer	2
Barium ricinoleate	2
Cadmium red	0.02

Analysis

Resin blend—A blend of Geon 121 and 202 resins results in lower viscosity plastisols when compared with straight Geon 121 compounds *(7)*. The combination used here enables the formulator to use higher viscosity plasticizers such as the polymeric type while maintaining a reasonable viscosity. The grainy "air surface" that usually results from the use of larger particle size Geon 202 resin is of no importance here because the exposed or "business" surface is a duplicate of the mold surface.

Dioctyl phthalate—Used because of its excellent resin solvating power during fusion and because of its relatively good non-migrating properties. It also serves to contain the polymeric plasticizer and eliminate any chance of bleeding. (See also data under "Spread Coating").

Polymeric plasticizer—Provides exceptional non-migratory properties to the compound, and, in the concentration used, maintains the soft skinlike feel required. Viscosity is kept at a medium level by the blend with dioctyl phthalate. (See also data under "Spread Coating").

Calcium carbonate—Contributes translucency to an otherwise transparent compound. This property is more nearly like natural skin texture than otherwise. (See also data under "Spread Coating").

Typical of slush molded products are these dolls and puppets. Made from paste resin, they are not only soft but are unbreakable.

Organic phosphate stabilizer—Protects compound against light exposure breakdown.

Barium ricinoleate—Protects against compound breakdown during the heat fusion stage of the slush molding process. The quantity indicated is sufficient when combined with the organic phosphate. Lead stabilization should be eliminated from consideration from this compound primarily because of the desire for lead-free materials which children may ingest. Secondarily, the lead stabilized doll parts may develop dark spots from contact with sulfur-bearing materials such as some rubber latex doll bodies contain.

Cadmium red—In the concentration shown will produce a flesh tint in the compound.

Moldable Putty ("Plastigel" Type Compound)

Application

Tan putty-like material moldable by hand or low pressure for educational models.

Desired Properties

1. Proper compound consistency for hand molding (extremely high yield value).
2. Maintenance of molded shape during "out of mold" fusion.
3. Non-tacky feel both before and after fusion.
4. Durometer A hardness of 85 to 90.
5. Sufficient cohesion and strength in fused compound to resist normal handling.

Starting Point Recipe

Geon 121 (PVC plastisol resin)	100.0
Dioctyl phthalate	100.0
Calcined kaolin clay	160.0
Calcium carbonate (high oil absorption)	25.0
Dibasic lead phthalate	5.0
Brown iron oxide	0.1

Analysis

Dioctyl phthalate—See data under "Spread Coating".

Calcined kaolin clay—Incorporated to eliminate stickiness in both the fused and unfused compound and, secondarily, to reduce cost. Although physical properties are degraded by the amount used, enough strength remains for the intended application.

High oil absorption calcium carbonate—Serves as a gellation agent for the plasticizer, providing putty-like consistency during molding and maintenance of shape during fusion.

Dibasic lead phthalate—Provides excellent heat stability during the fusion of heavy sections.

Brown iron oxide—Provides tan color desired.

Plastisol Dipping ("Plastigel" Type Compound)

Application

Dipping compound of 100% solids for application by cold dipping and subsequent baking to items such as tool handles, appliance parts and industrial equipment.

Desired Properties

1. Elimination of pre-heat cycle before tear-free dipping.
2. Important is a low ratio of plastic viscosity to yield value.
3. White compound of approximately 65 Durometer A hardness.
4. Uniform coverage of dipped item.
5. Low cost consistent with quality.
6. Good chemical, solvent and water resistance.

Starting Point Recipe

(Plastisol—100% Solids)

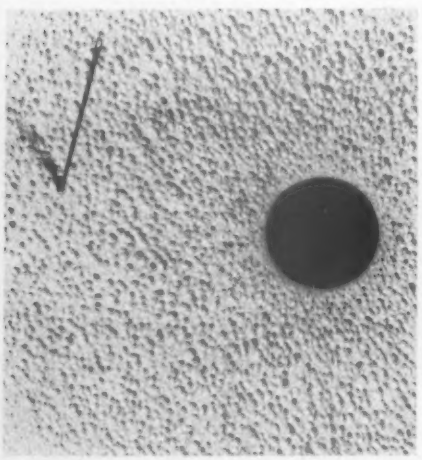
Geon 121 (PVC plastisol resin)	100.0
Dioctyl adipate	48.0
Trioctyl phosphate	23.0
Dioctyl phthalate	23.0
Aluminum stearate	1.4
Calcium carbonate (high oil absorption)	20.0
Titanium dioxide	5.0
Dibasic lead phosphite	3.0

Analysis

Dioctyl adipate—See data under "Spread Coating."

Dioctyl phthalate—See data under "Spread Coating."

Trioctyl phosphate—Viscosity stability on long time aging and extremely low compound viscosity are its chief contributions. The generally good chemical resistance of phosphate plasticizers is also desirable in this compound.



This cross-section of a Spongex fish net float demonstrates the uniformity of cell structure achieved with unicellular plastisol sponge. The cells are sealed off from one another.

Aluminum stearate + calcium carbonate—This combination enables the formulator to build the proper balance between plastic viscosity and yield value into the compound for tear-free dipping of cold items. Calcium carbonate also keeps compound cost in line.

Titanium dioxide—See data under "Spread Coating."

Dibasic lead phosphite—See data under "Spread Coating."

Organosol Dipping

Application

Dip coated white items fabricated from wire such as soap racks and dish drainers.

Desired Properties

1. Flow properties for good cold dipping—ratio of plastic viscosity to yield value of approximately 3:1.
2. Relatively heavy pick-up (approximately 10 mils).
3. Low cost consistent with quality.
4. White pigmented "stir-in" compound, approximately 80 Durometer A hardness.
5. Good gloss.
6. Fair adhesion.
7. Uniform blister and tear-free coating.

Starting Point Recipe

(Stir-in Organosol—90% Solids)

Geon 121 (PVC plastisol resin)	100
Dioctyl phthalate	33
Dioctyl adipate	32
Calcium carbonate (low oil absorption)	62
Titanium dioxide	5
Dibasic lead phosphite	3
High aromatic naptha (boiling range 315-350° F.)	26

Analysis

Dioctyl phthalate—See data under "Spread Coating."

Dioctyl adipate—Aids in lowering the viscosity of the compound while at the same time permitting a minimum amount of diluent. This is important because of the relatively heavy pick-up desired in this one dip process.

Calcium carbonate (low oil absorption)—Used in large amounts because of its cost reducing effect. This use is consistent with low viscosity and coating gloss maintenance.

Titanium dioxide—Provides white color and excellent opacity. Only a small amount is necessary in this compound because of the added effects of the dibasic lead phosphite and calcium carbonate.

Dibasic lead phosphite—See data under "Spread Coating."

High aromatic naphtha—Used as a viscosity reducing diluent. The solvent release characteristics of this material were determined as desirable consistent with prevention of blister formation. Addition of diluent effects viscosity reduction along with the attainment of a low ratio of plastic viscosity to yield value. During fusion a certain amount of shrinkage occurs to form a tight coat for optimum adhesion without primer.

Unicellular Plastisol Sponge

Application

Low density, closed cell vinyl plastisol sponge for application as padding, molded buoyant articles or insulation.

Desired Properties

1. Extremely low density (approximately 6 lb./cu. ft.).
2. Flame resistance.
3. Closed cell (unicellular) pore structure.
4. Weathering and aging resistance.
5. Chemical, especially water, resistance.

Starting Point Recipe and Procedure

Geon 121	100
Tricresyl phosphate (hard to soft)	65-100
Chemical blowing agent (nitrogen producing) (hard to soft)	20-30
Dibasic lead phthalate	3
Cadmium ricinoleate	2
Pigment	as desired

Note: Both the chemical blowing agent and the dibasic lead phthalate should be predispersed in plasticizer by grinding.

1. Fill suitable high pressure mold completely with compound.
2. Apply ram pressure equivalent to 5,000 psi on mold and heat for 20 minutes at 345-350° F. mold temperature. (Note: We have had some indication that large molded sections require lower temperatures in the 300-320° F. range. Most nitrogen producing blowing agents are exothermic and contribute heat for fusion. One typical blowing agent decomposes around 285° F.).
3. Cool under pressure to room temperature.
4. Release pressure and remove expanded sample from mold.
5. Heat sample at 250° F. for final expansion; time is dependent on the geometry of the product design.

Analysis

Tricresyl phosphate—Provides maximum flame resistance; however, it is somewhat unusual that some inflammable compounds possess good flame resistance when in unicellular sponge form.

Chemical blowing agent—Produces gas (preferably nitrogen) on thermal decomposition. This type of agent is desirable because of the low nitrogen permeability of the vinyl film and diffusion is slowed down by the fact that in most uses vinyl sponge is in contact with air (78% nitrogen). Best dimension stability on aging results.

Dibasic lead phthalate + cadmium ricinoleate—This combination has been found highly effective for prevention of heat breakdown in PVC stocks plasticized with TCP.

Color pigment—Normal colors suitable for vinyls are usable in most plastisol sponge compounds.

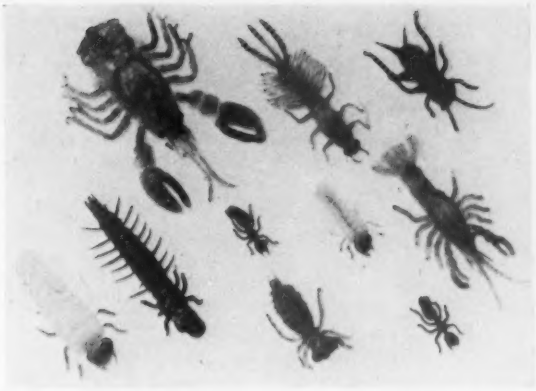
Low Pressure Injection Molding or Casting

Application

Transparent or translucent fishing lures produced with low cost equipment.

Desired Properties

1. Low to medium viscosity (under 6000 cps.) compound. Little or no yield value. Dilatancy preferably low.
2. "Lifelike feel" provided by soft stock.
3. Transparent, easily tinted or colored.
4. Processing heat stability and fairly good light stability.
5. Resistance to stiffening causes by water immersion and fungus or mildew.
6. Tough, tear resistant stock.



These artificial fishing lures, which are amazingly life-like in color, appearance and feel, are molded from Geon paste resin.

Starting Point Recipe

Geon 121 (PVC plastisol resin)	60
Geon 202 (copolymer resin)	40
Dioctyl phthalate	50
Hydrogenated terphenyl	50
Organic tin stabilizer	3

Analysis

Resin blend—See data above under "Slush Molding." In this case plasticizer content must be maintained above the necessary level for good fluidity in order to provide a lifelike feel, but the lower cost copolymer resin is still a good choice. The 100 part level for total plasticizer compromises fluidity, feel, and toughness.

Dioctyl phthalate—Resistant to water leaching and fungus. See also data under "Spread Coating."

Hydrogenated terphenyl—Low cost, light colored secondary plasticizer. Resistant to water leaching and should be adequate against fungus.

Organic tin stabilizer—Provides excellent heat stability and some light stability to non-opaque stocks.

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Beta-Ray Gaging in the Rubber Industry

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NEARLY one half million dollars worth of raw rubber gum is calendered and extruded each year, while the value of the finished product is several billion dollars. Inability to hold processed material exactly to nominal weight or within very close tolerances, results in annual waste of millions of dollars in both raw material and finished products. Any small improvement in the ability to hold close tolerances would result in large savings.

Material specifications state the minimum amount of rubber thickness for each product. Because of the lack of adequate measuring equipment to detect variations in the manufacturing process, excess rubber must be used to insure meeting specifications.

In addition to the excess raw materials used, millions of dollars worth of fabricated rubber products must be refabricated because they do not meet specifications. The operator either cannot control to specified tolerances, or he does not know when he exceeds them. This loss is more costly to a company than that resulting from excess use of raw material, because of the large expense having gone into processing the product.

The ability to hold closer tolerances not only results in savings from raw material and less reprocessing, but also yields higher quality products. Uniformity along each roll, across the width, and between successive rows results in a more useful product with fewer complaints.

Within the last few years a new instrument, the beta-ray gage, has been developed, and it is now possible for the operators in rubber plants to know the product weight immediately with better than 1 percent accuracy. This non-contacting instrument is a great step forward in the art of measuring—or gaging—and makes possible the advantages of closer tolerances mentioned above.

The beta-ray gage is a weight measuring device, and is generally calibrated in units of weight per unit area. This can be pounds or ounces per square yard, milligrams per square centimeter or pounds per ream. In metal applications, where the material is homogeneous, the reading can be converted to thickness measurement. In the rubber industry, concern is with weight—from purchasing to final product specifications—and the beta-ray gage is therefore particularly adaptable.

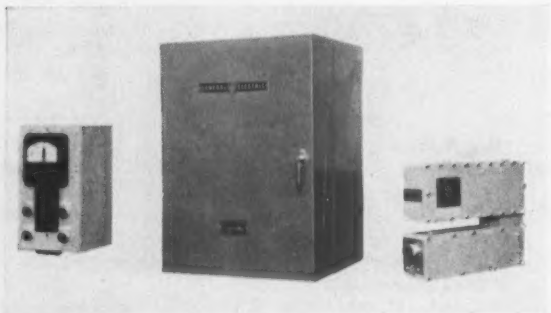

FIG. 1—G-E beta-ray thickness gage showing, left to right, operator's panel, control cabinet, and gage head.

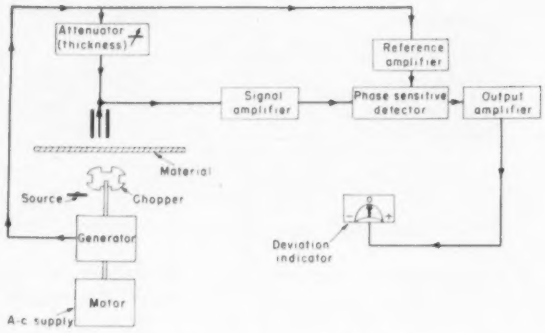

FIG. 2—Block diagram of a beta-ray thickness gage.

Figure 1 shows the basic components of one manufacturer's gage. It consists of the gage head, the electronic control cabinet and the operator's control. The radioactive source located in the lower gage head directs a beam of high energy electrons—or beta rays—toward an ionization chamber in the upper gage head. Material placed in the path of this beam absorbs, or stops, some of the beta rays from reaching the ionization chamber. Those beta rays that enter the chamber create an electrical signal, the magnitude of which is related to the amount of rays entering. The signal is amplified in the electronic control cabinet, and fed to an indicator on the operator's control panel which tells how much material is in the throat. Because no contact is made with the material, this type of gaging is particularly adaptable to continuous process measurements of rubber products.

Figure 2 shows one system used in beta-ray gages. The beta-ray is emitted from the radioactive source, interrupted by a chopper, and passes through the measured material, giving a pulsed signal to the ionization chamber at a rate of 90 times per second. A synchronous motor drives both the chopper and an alternator (Figure 3), which generates a 90-cycle signal from each. The signal from the alternator is passed through an attenuator and bucked against the signal from the ionization chamber in phase opposition. When the voltage of the attenuator equals the voltage from the ionization chamber, there is complete cancellation of the 90-cycle signal and the deviation indicator reads zero. The output voltage from the attenuator is a measure of the ionization chamber output voltage and therefore the amount of material interposed between the beta-ray source and the ionization chamber. The attenuator is the gage dial, which is mounted on the operator's panel.

If the weight per unit area of the material should

deviate from the value for which the gage dial is set, a 90-cycle error signal will appear in the input to the amplifier. This alternating signal is amplified and applied to a phase-sensitive detector which, in turn, produces a d-c voltage whose polarity and magnitude depend upon the phase and magnitude of the error signal. This error signal is passed through a smoothing filter and a d-c power amplifier stage to an appropriate recorder or indicator.

The first beta-ray gages were made four years ago. Original installations were principally in metal rolling industries, and it was not until December, 1950, that the first beta-ray gage rubber application was made at the plant of the Armstrong Rubber Manufacturing Co. in Des Moines, Iowa (Figure 4).

Armstrong, a manufacturer of automobile tires, uses the gage to measure and control the weight per unit area of the rubberized tire fabric as it emerges from calender rolls. Records kept the first five months the gage was in use showed good improvement in their ability to hold closer tolerances to a standard weight on average rollout of 800 lbs. on a net 220 yard roll. Rolls departing from standard by 11 to 20 lbs. were decreased from 32.5 to 17% during the first five months, while rolls departing from standard by 0 to 10 lbs. were increased from 56 to 73%. Mr. J. F. Berg, Armstrong Fabric Engineer who conducted the test, said: "We feel it is a very satisfactory instrument and one that should be considered as standardized equipment in all Armstrong plants." Subsequent use of the gage has verified Mr. Berg's opinion.

Since the installation of the first beta-ray gage at Armstrong, many rubber companies, large and small, have installed beta-ray gages to control their processes. It has been claimed that in several instances, companies in the rubber, plastics, and paper industries are saving up to $100,000 a year with a single beta-ray gage. Additional or optional features available with the basic gage increase its ease of operation and usefulness for certain applications.

The basic gage shown in Figure 1 requires little attention by the mill operator. Periodically, the operator should manually reset the gage to correct for any drift and other factors which may have contributed to errors in the gage reading. This procedure is quite simple and takes less than 30 seconds to perform. For installation where it is not practical for the mill operator to make this manual adjustment, gages are available to make this correction automatically.

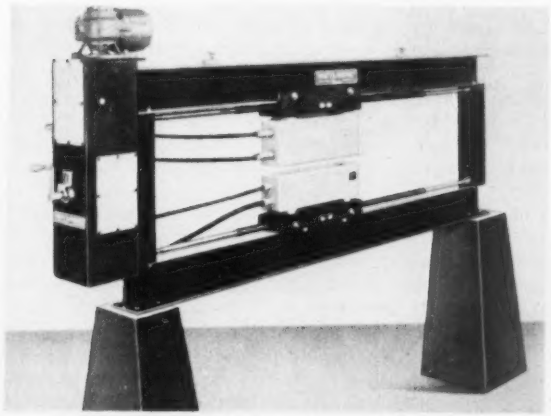

FIG. 3—A synchronous motor drives both the chopper and alternator on this traversing gage system.

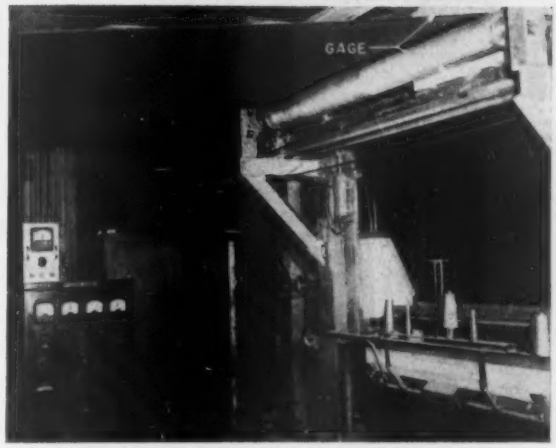

FIG. 4—Beta-ray gage installation at the Armstrong Tire plant in Des Moines. The operator's control with deviation indicator is seen at the left, while the arrow points to the partially hidden gage head.

The basic gage looks at a spot from 2½ to 6 inches in diameter, depending upon the type of gage, and so it measures a strip of moving material which is 2½ to 6 inches wide. In some cases it is only necessary to measure one edge or one strip along the moving material. In other cases, it is desirable to measure both sides of the strip material by using either two gages, one mounted on each side of the strip, or by traversing one gage back and forth across the strip. In some operations where it is desirable to measure at a number of points across the width of the strip, traversing is necessary. Traversing systems are available which will position the gage head automatically at preselected points for a desired period of time, and record the weight at each location. Figure 3 shows one type of traversing system where the separated upper and lower gage heads are separated and mounted on "I" beams and are moved back and forth by means of lead screws.

The basic gage has an indicator to inform the operator what weight he is rolling or extruding. It is often desirable to keep a permanent record of what has been made, and recorders with appropriate calibrations are available as accessories.

In one system the nominal weight in lbs. per sq. yd. is recorded as a straight line by one pen and the deviation in lbs. per sq. yd. is recorded by a second pen on the same chart. A similar version substitutes percent deviation from nominal weight, or weight deviation. Figure 5 illustrates a typical recorder chart with gage setting and weight deviation. Figure 6 shows a typical recorder.

Another system records only actual weights being rolled. In all cases, tolerance markers are available to make it more obvious to the operator when the product weight is within specified limits.

Although beta-ray gaging is a big improvement over previous methods of continuously measuring strip material, more development now in progress will make the gage even more accurate and useful in the future.

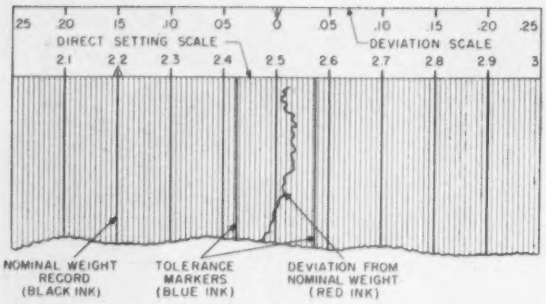
.25 .20 .15 .10 .05 0 .05 .10 .15 .20 .25
DIRECT SETTING SCALE
DEVIATION SCALE
2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3
NOMINAL WEIGHT RECORD (BLACK INK)
TOLERANCE MARKERS (BLUE INK)
DEVIATION FROM NOMINAL WEIGHT (RED INK)

FIG. 5—Representative recorder chart showing weight deviation.

Certain factors in production contribute to inaccuracies in the use of the gage, and for best performance they should be controlled as closely as possible. The gage "sees" and measures all material between the source and ionization chamber. Since air and its moisture content are part of this material, they are being measured as well as the moving product. This is important mainly in very light materials. For a given atmospheric condition, the gage can be calibrated to read the correct weight of material in the throat. However, as the density of air in the throat changes with humidity or temperature, the gage indicates this change and does not differentiate from change in weight of material being gaged. In gaging lighter materials, such as plastics and paper, where the weight of the air column is an appreciable part of the total weight, it is particularly important to keep temperature variations to a minimum for best results.

Moderately successful attempts have been made to minimize the effect of "pass line" on the gage reading. Because the electrons tend to "scatter" when they hit the strip material in the throat, not all of them reach the ionization chamber. As the strip position changes, a larger or smaller number of electrons is scattered away from the chamber, affecting the gage reading. It is therefore necessary to maintain pass line within limits specified by the manufacturer for best performance.

The ability to measure the weight of material accurately depends upon the ability to measure changes in ionization chamber current. Figure 7 shows the absorption characteristics of Strontium 90 beta rays in weight per unit area versus ionization current.

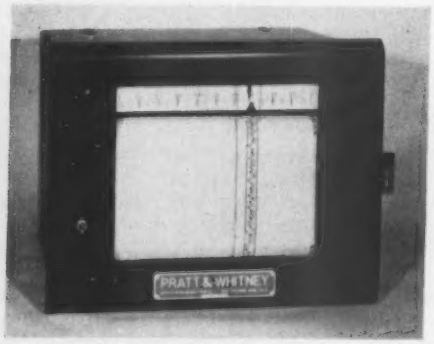

FIG. 6—Typical recorder used with beta-ray gages.

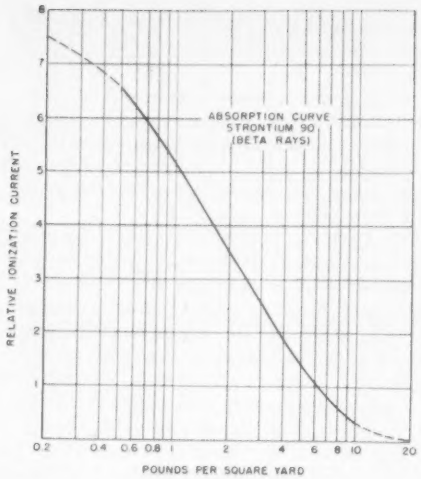
RELATIVE IONIZATION CURRENT
ABSORPTION CURVE STRONTIUM 90 (BETA RAYS)
1 2 3 4 5 6 7 8
0.2 0.4 0.6 0.8 1 2 4 6 8 10 20
POUNDS PER SQUARE YARD

FIG. 7—Absorption characteristics of Strontium 90 beta rays in weight per unit area versus ionization current.

Inspection of this curve reveals that over the range of 1 to 10 pounds per square yard, a given percentage change in material causes the greatest percentage change in ionization current. The ability to measure these larger current changes more accurately than small changes makes the gage most accurate in this range.

The emission of beta particles from the Strontium 90 radioactive source is a random phenomenon, and the fluctuation in their rate of emission produces a varying or "noisy" signal. For most applications this random fluctuation is not important. It is always possible to read between the maximum peaks of the variation to get the real or average reading which indicates the actual weight of material. If a process cannot tolerate this fluctuation, it can be reduced by filtering the signal from the ionization chamber which collects the beta rays. If the signal is filtered to reduce fluctuation, the time of indicator response to changes in weight of material is necessarily made slower. If a dead zone is used to eliminate noise, particularly if this is done through the friction of a recorder pen on the chart, the gage will not respond to small changes in material weight.

As speed of response is made faster, noise becomes greater, and the gage user must determine which of these factors is most critical and compromise between them. Less noise might be obtained without reducing speed of response by using a stronger radioactive source. However, this raises problems which make it desirable not to exceed this strength of source.

The beta-ray gage continuously measures weight of moving strip material, and has applications on rubber, plastics, paper, abrasives and ferrous and nonferrous metals. Because it does not touch the material it gages, it can be used to measure wet, sticky, soft, or highly-polished material which is not amenable to contact gaging. Operators may come to gage quickly, and maintain closer tolerances than ever before. Speed and precision require closer tolerances on many materials, and the highly accurate beta-ray gage is making large contributions to the advancement of our industrial society and our national defense effort.

Pilot Plant Production of Lactoprene EV

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LACTOPRENE EV is an acrylic copolymer made from a monomer charge composed of 95 percent ethyl acrylate and 5 percent chloroethyl vinyl ether. The copolymer itself contains about 97 percent ethyl acrylate and slightly more than 3 percent chloroethyl vinyl ether. The properties of this material and other acrylic elastomers, and their preparation on a laboratory scale, have been described in several papers *(1-17)*.

Lactoprene EV in the pilot plant, along with other polymers and copolymers of acrylic esters, has been produced at the Eastern Regional Research Laboratories on a rather small scale, i.e., in a glass-lined batch polymerizer of 10-gallons capacity. Recently it has been made in 80-gallon reactors at the Government Laboratories operated by the University of Akron as agent for the Office of Synthetic Rubber.

In this work, an emulsion polymerization system was employed because it is generally used and understood by industry. It is relatively easy to control and gives a product in latex form for which there are many uses. With further processing, this system also gives a solid elastomer for which there is a wide field of application. In general, the process may also be used in making other acrylic polymers and copolymers.

Because of the interest shown by industry in the special properties of Lactoprene EV, it was thought desirable to describe at this time some of the pilot-plant work on the elastomers.

Process

In producing Lactoprene EV, the ethyl acrylate monomer, a liquid at room temperature, is first washed with caustic soda to remove the inhibitor (Figure 1). The washed monomer is premixed with the chloroethyl vinyl ether comonomer, also a liquid, which is normally stored without inhibitor. After water, emulsifiers, and part of the catalyst solution have been added to the charge tank and mixed, the premixed monomers are added. This mixture is then charged to the polymerizer,

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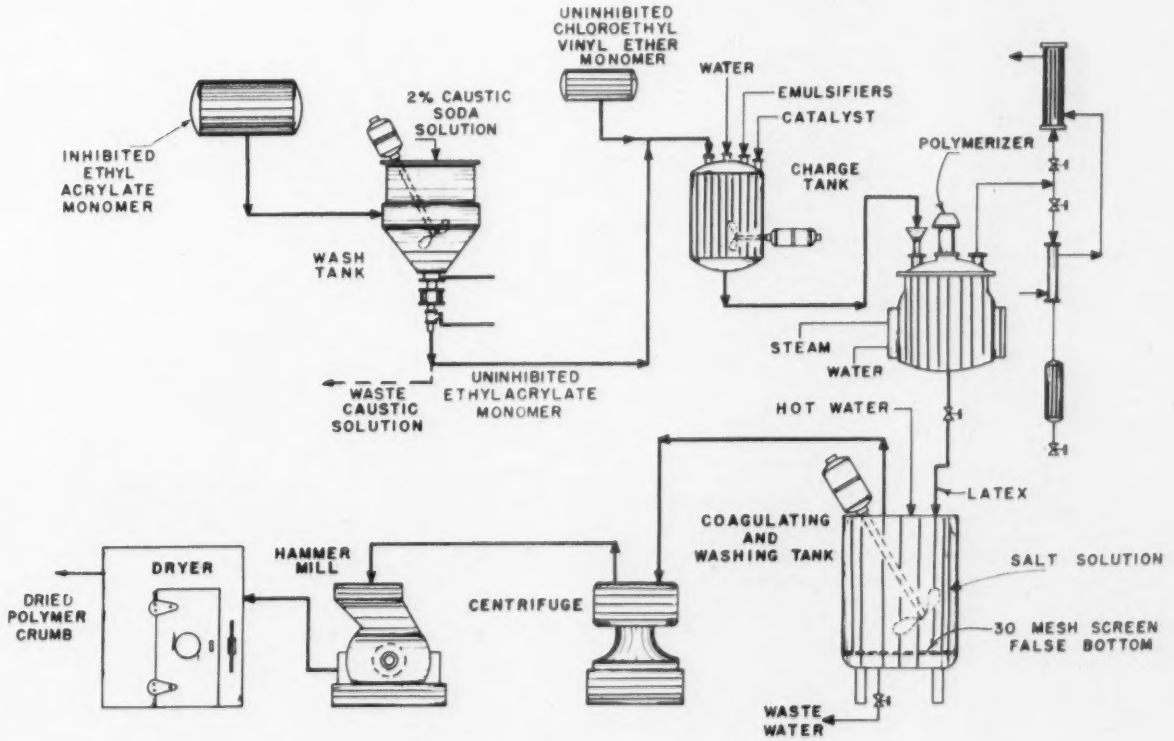

FIG. 1—Flow sheet of the Lactoprene EV process.

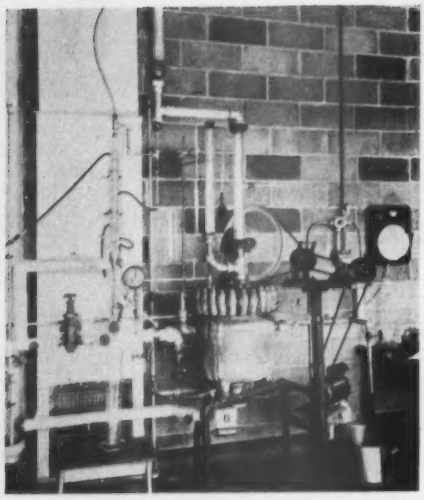

FIG. 2—10-Gallon polymerization unit.

which is equipped with a reflux condenser, and operated at atmospheric pressure.

The charge is heated by steam (and later hot water) to the refluxing temperature. After a few minutes at the initial refluxing temperature of 82° C., the polymerization starts vigorously. Part of the heat generated by the polymerization is removed in the reflux condenser and part by the cooling jacket. The reaction continues fairly vigorously until a temperature of about 86° C. is reached, when more catalyst solution is added to maintain the polymerization at a reasonable rate. Heat is also applied through the jacket as required.

When the temperature of the charge reaches 95 to 96° C., the rate of polymerization is slow and the conversion is about 95 percent complete. The unreacted monomers are then stripped with live steam. The total cycle from charging the polymerizer to cooling the latex requires about 3 hours.

If the elastomer is to be obtained in solid form, the latex product is slowly drained from the polymerization kettle into a hot, agitated salt solution, which coagulates it in the form of small granular pieces resembling cottage cheese. The coagulated rubber crumb is washed with hot water to remove the salt and emulsifiers.

The washed elastomer particles can be dewatered in a centrifuge. In most cases this forms a mat, which must be passed through a hammer mill to disintegrate it for drying in a through-circulation air dryer. The elastomer crumb is dried at about 200° F. for approximately one hour. It is then ready for fabrication.

Operations

Purification of Monomer: The ethyl acrylate monomer as received is usually inhibited with about ¼ of 1 percent hydroquinone, which must be removed. This may be done by washing the monomer about three times with 2 percent caustic soda solution, the volume of each wash being equal to approximately one-third of the volume of the monomer. The washing can best be accomplished in a cone-bottom wash tank equipped with a bottom sight glass. Agitation time for each wash should be about 5 minutes before the waste caustic solution is allowed to settle and drain off.

With careful manipulation, monomer losses can be held between 5 and 10 percent. To determine whether additional washing is required, a small amount of the monomer is vigorously shaken with about an equal volume of 2 percent caustic solution. The appearance of any color in the caustic solution layer in less than 1 minute indicates the need for additional washing.

As chloroethyl vinyl ether is not so active as the ethyl acrylate, it is usually uninhibited and is ready for use as received.

Polymerization: The emulsion polymerization of the acrylates was carried out under atmospheric reflux conditions. As the acrylates polymerize at an extremely high rate initially, another method for dissipating the heat of reaction, in addition to the normal one through the jacket of the reactor, was considered desirable. The reflux condenser serves this purpose, as it removes the heat of polymerization primarily by refluxing volatile materials in the charge. This method of heat removal is quick and positive.

Another advantage of this type of polymerization is that its progress can be observed by noting the refluxing temperature of the charge, i.e., as the conversion progresses, the temperature of the charge increases.

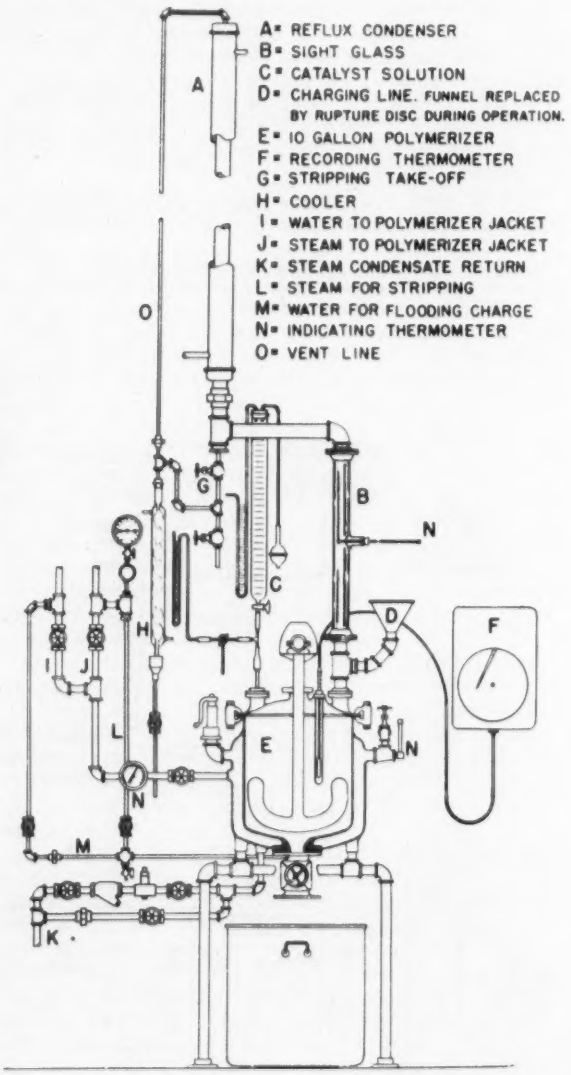
A= REFLUX CONDENSER
B= SIGHT GLASS
C= CATALYST SOLUTION
D= CHARGING LINE. FUNNEL REPLACED BY RUPTURE DISC DURING OPERATION.
E= 10 GALLON POLYMERIZER
F= RECORDING THERMOMETER
G= STRIPPING TAKE-OFF
H= COOLER
I= WATER TO POLYMERIZER JACKET
J= STEAM TO POLYMERIZER JACKET
K= STEAM CONDENSATE RETURN
L= STEAM FOR STRIPPING
M= WATER FOR FLOODING CHARGE
N= INDICATING THERMOMETER
O= VENT LINE

FIG. 3—Schematic view of the 10-gallon polymerization unit.

As previously mentioned, the polymerization unit (Figures 2 and 3) is of 10-gallon capacity and has a heating jacket with slightly more than 5 square feet of surface area. It is glass-lined and equipped with an anchor-type agitator driven between 10 and 80 r.p.m. by a variable speed drive. A 2-inch diameter glass sight section between the reflux condenser and the kettle enables the operator to observe the refluxing and also any foaming tendencies of the charge. The reflux condenser, 2 inches in diameter by 5.5 feet long, contains about 3 square feet of condensing surface. A take-off line at the bottom of the reflux condenser leading to a cooler is used in the stripping operation.

Automatic controls have not been used. No difficulties were encountered in controlling by hand, particularly after the diameter of the reflux condenser was enlarged from 1 to 2 inches to prevent vapor-liquid binding, and the condensing surface was increased from 1½ to 3 square feet. However, as a precaution in case the reaction becomes uncontrollable, the charge can be flooded with water from a line provided for this purpose.

Several emulsifying systems for polymerizing the monomers have been studied in the pilot plant. Probably one of the best for general use is the one in which 1.2 percent (moisture-free basis) Tergitol Penetrant No. 4 and 0.8 percent (moisture-free basis) Triton 720, based on the total monomers, are used.* Latex made by this system is easy to coagulate; it is merely necessary to add the latex slowly to a hot, agitated brine solution to obtain the elastomer in small granular particles. Although some other emulsifying systems are more stable in the polymerizer, when the foregoing emulsifiers and a charge containing about 40 percent monomers are used, as many as four runs can be made in the 10-gallon unit before cleaning is necessary.

Table I shows a typical charge formula for this low-solids Lactoprene EV latex. The water, a part of the catalyst solution, and the emulsifiers are added to the charge tank, and agitated to assist solution of the emulsifiers. The two monomers are then premixed and added, and the total charge is then added to the polymerization unit. Only a small amount of catalyst is required because of the reflux polymerization method. About 0.005 percent of ammonium persulfate is required, based on the monomers. To decrease the intensity of the polymerization at the start, only a part of the catalyst, say about 40 or 50 percent, is added to the charge; more catalyst is added later as the polymerization rate decreases. The agitation rate for most of the runs has been about 38 r.p.m.

After charging, steam is applied to the jacket until the temperature of the charge reaches about 75° C., at which point the heating system is changed to hot water at about 99° C. by using the steam-water mixer. Refluxing starts

* Mention of products or companies should not be construed as a recommendation or endorsement by the Department of Agriculture or the Office of Synthetic Rubber over others not mentioned.

TABLE I—CHARGE FORMULA A FOR LOW-SOLIDS LACTOPRENE EV LATEX

Ingredients	Pounds	Parts by weight
Ethyl acrylate	20.0	95.0
Chloroethyl vinyl ether	1.05	5.0
Water	31.7	151.0
Tergitol Penetrant No. 4 Paste (m.f.b.)	0.25	1.2
Triton 720 (m.f.b.)	0.16	0.8
Ammonium persulfate	0.0011	0.0052

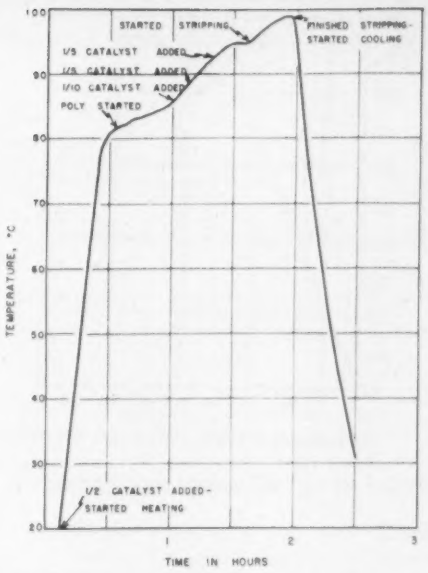

FIG. 4 — Polymerization temperature curve (40% monomer concentration).

at 82° C., and after a few minutes vigorous polymerization begins (Figure 4). Refluxing may be indicated first by a slight fluctuation in the manometer attached to the polymerizer, thus making it possible to apply cooling water to the jacket before the reaction becomes too vigorous.

As mentioned before, most of the heat of polymerization is dissipated through a reflux condenser. The heat generated vaporizes monomer and water, which in turn are condensed in the reflux condenser and return hot to the system. No difficulty is encountered in re-emulsifying the returned monomer, and apparently refluxing of the monomer has little effect upon the particle size of the finished latex, most of the particles being less than 0.5 μ in diameter. With an adequate reflux condenser capable of removing the heat of polymerization, the tendency has been to use the jacket of the 10-gallon unit primarily for heating purposes, i.e., for raising the temperature of the charge to its starting reflux point and for the later part of the polymerization.

As the polymerization proceeds, the reaction begins to slow down at about 85 to 86° C., and it is necessary to add the remainder of the catalyst solution, approximately in one-tenth increments. It is also necessary to apply heat to the jacket from this point until the end of the run. By the end of the last catalyst addition, the temperature is about 95 or 96° C., and about 95 percent of the monomers have been polymerized. Figure 5 shows a typical conversion curve for Lactoprene EV.

At this point, the rate of reaction is extremely low. The unreacted monomers are then stripped with live steam injected into the bottom of the charge. The jacket temperature is held at 100° C. with hot water. About one-half hour is required to strip these monomers. Because of the foaming tendency of the latex, the stripping operation has to be carried out rather slowly. The percentage of stripped monomers that can be subsequently polymerized has not been determined.

For preparing a latex that is more stable and has a higher solids content about 55 percent, a good emulsifier system consists of 3 percent (moisture-free basis) Triton 720 and 1 percent Triton R-100, based on the total

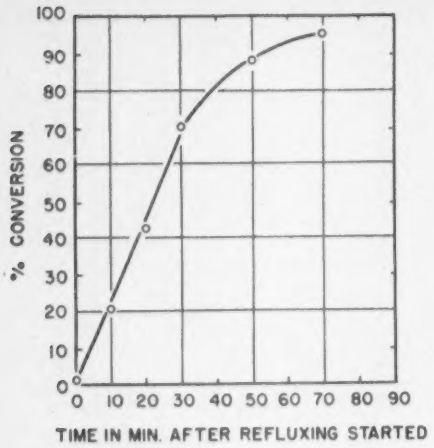

FIG. 5—Polymerization conversion curve.

monomers. The Triton R-100, a dispersing agent, has been added primarily for the purpose of decreasing the viscosity peak of the charge in order to permit uniform and rapid dissipation of the heat of polymerization to the cooling mediums.

Table II shows a typical charge formula for this high-solids Lactoprene EV latex, which is more stable to coagulation. Figure 6 shows a temperature curve for this type of run.

Coagulating and Washing: The equipment used for coagulating and washing the elastomer consists of a 25-gallon stainless steel tank equipped with an agitator, baffle and false bottom.

In coagulating, the hot 40 percent latex is slowly drained from the polymerizer into the stainless steel tank containing an agitated brine solution composed of 10 pounds of salt (NaCl) in 10 gallons of water at 180° F. The latex coagulates into small, granular, porous pieces, which are easily washed. Washing the elastomer with hot water to free it of salt may be done batchwise or continuously in the same tank; the hot water is added at the top, and waste water is withdrawn through a false bottom. As the coagulum is similar in physical form to GR-S crumb, it is probable that a continuous rotary vacuum filter such as that used in some of the GR-S plants could be used in washing and dewatering the Lactoprene crumb. Because of lack of proper equipment, this procedure has not yet been tried at this laboratory.

The more stable 55 percent latex is not satisfactorily coagulated with salt; therefore, a method has been developed in which an aluminum sulfate solution is used. In this procedure, 15 parts of 3 percent $Al_2(SO_4)$ $3.18H_2O$ solution are slowly added to 100 parts of the agitated cooled latex, causing it to thicken or cream. The creamed latex is then added to about 1000 parts of agitated water at a temperature of approximately 130 to 140° F. The elastomer coagulates in the form of small particles, which are easily washed by the procedure described above. The particle size may be varied by varying the temperature of the coagulating water used in the process.

Dewatering and Drying: The washed elastomer from either of these two methods, suspended in water, is passed over a vibrating screen to remove free draining water and then is loaded on drying trays. An alternative method is to dewater the elastomer in a centrifuge. This, however, may cause the rubber to form a mat, which requires hammer milling to disintegrate it. The elastomer is then loaded on trays and dried in a through-circulation air dryer for approximately one hour at a temperature of about 200° F. As the elastomer is resistant to degradation by oxidation and sunlight, it may be stored indefinitely.

TABLE II—CHARGE FORMULA B FOR HIGH-SOLIDS LACTOPRENE EV LATEX

Ingredients	Pounds	Parts by weight
Ethyl acrylate	23.1	95.0
Chloroethyl vinyl ether	1.2	5.0
Water	19.9	82.0
Triton 720 (m.f.b.)	0.72	3.0
Triton R-100	0.24	1.0
Ammonium persulfate	0.0013	0.0053

Polymerizations in 80-Gallon Reactors

To conduct polymerizations on a pilot-plant scale larger than the 10-gallon unit, arrangements were made with the Office of Synthetic Rubber to carry out the Lactoprene EV polymerization in equipment available at the Government Laboratories in Akron, operated by the University of Akron. After a few preliminary runs in 5-gallon reactors to test the efficacy of the raw materials and to determine the most suitable charging procedure, the desired polymerizations were made in glass-lined 80-gallon reactors.

Figure 7 shows a diagram of an 80-gallon reactor with its reflux and control system. The system was designed to operate at 125 pounds per square inch gage, but may be operated at pressures as low as 200 millimeters of mercury, absolute (the minimum pressure attainable with the vacuum jets). For these runs, a relief valve, set to open at 3 pounds per square inch, was installed in the vent line at the top of the noncondensable vapor trap; the main purpose of the relief valve was to provide a means of controlling the venting of noncondensable vapors from the system.

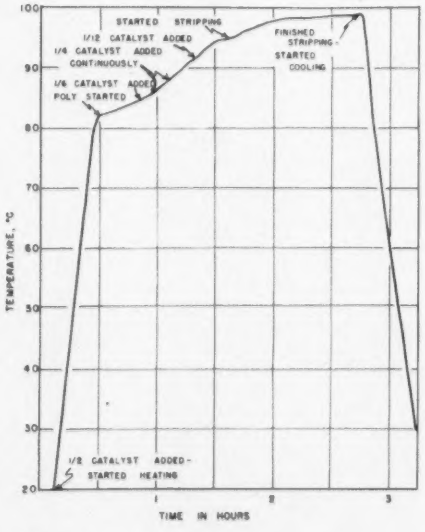

FIG. 6 — Polymerization temperature curve (55% monomer concentration).

Operations in 80-Gallon Reactors

Successful runs were made in accordance with the two charge formulas used in the 10-gallon reactors, except that potassium persulfate was used as the catalyst instead of ammonium persulfate. Table III shows the charge formulas.

The inhibitor was removed from the ethyl acrylate by the method used for charges in the 10-gallon reactor, except that the time for each step was somewhat longer because of the greater quantity of material handled.

For Formula A, charge factors of 1.2, 2.12, and 2.4 pounds per part were used, which represented loadings of 45, 80, and 90 percent, respectively. For Formula B, charge factors of 1.79, 2.15, and 2.51, which represented loadings of 50, 60, and 70 percent, respectively, were used. The water, containing the dissolved emulsifiers, was charged to the reactor first. Five pounds of water were withheld for solution of the catalyst portions, and 25 pounds were reserved for rinsing the charging equipment and lines.

Agitation was started, and the premixed monomers were charged. Because of the instability of potassium persulfate during prolonged heating above 140° F., the catalyst was withheld until the internal temperature of the reactor reached 180° F. The catalyst was added in increments as required to sustain the polymerization. However, if careful control was maintained, the total amount of catalyst required could be added initially.

The temperature of polymerization was controlled by circulating water through the jacket of the reactor and by refluxing the boiling monomers. The temperature of the batch during refluxing was between 180° and 210° F., provided the pressure in the system was below 3 pounds per square inch. In several cases, when the reaction rate was too high and difficult to control, the valve in the line between the noncondensable vapor trap and the relief valve was closed, allowing the temperature and pressure to rise; maximum temperatures and pressures of 260° F. and 60 pounds per square inch were attained.

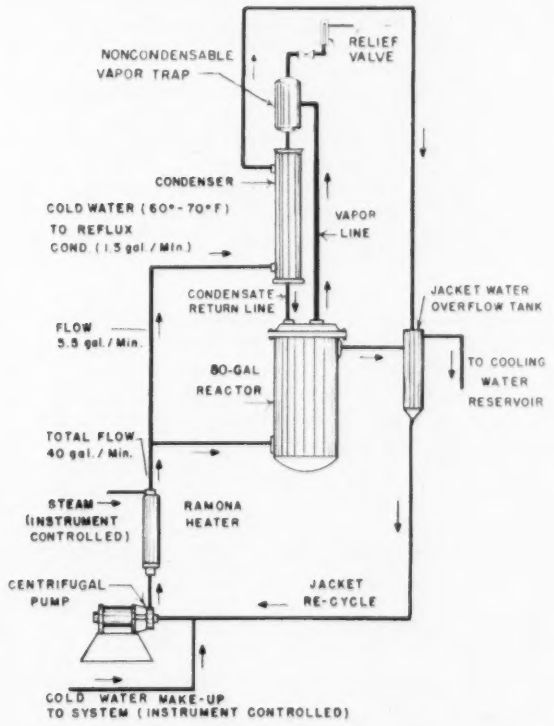

FIG. 7—80-Gallon polymerization unit with reflux system.

TABLE III—CHARGE FORMULAS USED IN 80-GALLON REACTORS*

Ingredients	Formula A (Parts)	Formula B (Parts)
Ethyl acrylate	95.0	95.0
Chloroethyl vinyl ether	5.0	5.0
Tergitol Penetrant No. 4 (m.f.b.)	1.2	None
Triton 720 (m.f.b.)	0.76	3.0
Triton R-100	None	1.0
Potassium persulfate	0.00522†	0.01†
Water	151.0	82.0

* No shortstop necessary. † Amount necessary to initiate polymerization.

The heating and cooling system was designed and operated so that a definite temperature differential was maintained between the temperature of the water in the jacket of the reactor and that in the jacket of the condenser. The temperature differential was adjusted so that the temperature in the jacket of the condenser was low enough to condense the monomer vapors but not low enough for the pressure drop between the reactor and the condenser to cause excessive foaming and allow a large quantity of latex to surge into the condenser.

The discharge valve of the pump for circulating water through the jackets was set to deliver 40 gallons per minute. The water from the pump plus the added water from heating steam was split into two streams; 5.5 gallons per minute were diverted to the jacket of the condenser, and the remainder was delivered to the reactor jacket. One and one-half gallons per minute of cold water, at a temperature of 60 to 70° F., were added to the stream going to the jacket of the reflux condenser. With these flow rates and a condensing surface area of 38 square feet, a temperature differential of 25° to 35° F. was attained when the internal temperature of the batch was 180° F. before the reaction was initiated and up to 210° F. after most of the polymerization had occurred.

Stripping was accomplished at a temperature of 140° to 160° F. and a vacuum of 20 to 24 inches of mercury. Internal steam was used in stripping the latex prepared by Formula A, but none was used in stripping the high-solids latex. With both types of latex, it was necessary to reduce the vacuum during the preliminary stages of stripping to prevent excessive foaming.

The Lactoprene EV prepared in accordance with Formula A was coagulated by adding 1 part of latex at 180° F. to 2 parts of an agitated 10 percent sodium chloride solution at 150° F. The latex prepared according to Formula B was creamed with 15 parts of a 3 percent solution of alum per 100 parts of latex. The creamed latex was coagulated by pumping 1 part into 10 parts of agitated water at 130° to 140° F. The crumb from both types of coagulation was washed free of salt with hot water and subsequently dried at 200° F. The regular GR-S salt-acid method of coagulation was unsuccessful with small samples of both types of latex.

Fifty gallons of low-solids latex from Batches 14HGA1, 14HGA2, and 14HGA3 (Table IV) were coagulated to produce XP-102-L2 polymer. The remaining latex of these batches, blended with Batch 14HGA4, was coagulated for XP-101-L1 polymer. Batch 14HGB5

TABLE IV—POLYMERIZATION DATA

Charge formulas	Polymerization batch no.	Product no.	Conv. (%)	Total solids (%)	React. time * (Hrs.)	Mooney viscosity (ML-4)	Poly. temp.† (° F.)
A	14HGA1, 14HGA2, 14HGA3, 14HGA4	XP-101-L1 and XP-101-L2 (polymer)	85	34	1.8	54	190-200
B	14HGB5	XP-102-L1 (high-solids latex)	93	52	1.5	58	190-200
B	14HGB4	XP-103-L1 (polymer)	90	50	0.8	44	180-260
B	14HGB1, 14HGB2	XP-103-L2 (polymer)	—	—	3.0	58	195-210

* Time for 90 percent of the total conversion. Induction period, when an insufficient amount of catalyst was charged initially, is not included. † Temperature at which 90 percent of the conversion occurred.

of high-solids latex was used for XP-102-L1 (latex), 14HGB1 and 14HGB2 were coagulated for XP-103-L2 (polymer) and 14HGB4 for XP-103-L1 (polymer).

Chemical tests and screening tests for physical properties were made on these polymers.

Polymerization: Table IV shows polymerization data for the two types of latex. The amount of potassium persulfate needed to initiate the reaction of Batches 14HGA1 through 14HGA4 (used for XP-101-L1 and XP-101-L2) was determined to be 0.00522 part per 100 parts of monomer charged. Batch 14HGA2, however, failed to react with this amount charged initially, possibly because of a trace of inhibitor that remained in the ethyl acrylate.

When the reactor was loaded to 90 and 80 percent of its capacity for Batches 14HGA3 and 14HGA4, respectively, the reflux condenser was flooded after the polymerization was initiated. At a loading of 45 percent for Batches 14HGA1 and 14HGA2, flooding did not occur.

One one-hundreth part of potassium persulfate was determined as the amount necessary to initiate the reaction of the high-solids batches used for XP-102-L1, XP-103-L1, and XP-103-L2. For no accountable reason, the first two batches did not react with this amount, and additional increments of the catalyst were required to initiate the reactions.

Temperatures of Batches 14HGB3 and 14HGB4, in which an excess of catalyst was charged initially, rose from 180° to 250° and 260° F., respectively, in 2 to 3 minutes. As soon as the pressure increased above 3 pounds per square inch and the noncondensable gases were vented, the valve between the noncondensable gas trap and the relief valve was closed, and the pressure in the reactor reached a maximum of 50 and 60 pounds per square inch for Batches 14HGB3 and 14HGB4, respectively. Data are not shown for Batch 14HGB3 because the reaction was stopped at a low conversion by cold water that leaked through a tube sheet of the condenser; the resulting material was discarded.

The reactions in Batches 14HGB3, 14HGB4 and 14HGB5, in which 0.020, 0.0175, and 0.010 part of potassium persulfate, respectively, was charged initially, started rapidly, and about 90 percent of the final conversion for 14HGB4 and 14HGB5 was attained in 0.8 and 1.5 hours, respectively. For these batches, the reactor was charged to 60 percent of its capacity, which was about maximum load for the 80-gallon reactor system.

During polymerization of the high-solids batches, 14HGB3 and 14HGB4, the materials in the reactor flooded the reflux condenser for 15 to 20 minutes. In Batch 14HGB4, the temperature differential between the water in the reflux condenser and that in the reactor jacket ranged from a maximum of 54° to 0° F. at the end of the flooding period, and the temperature differential between the water entering and leaving the condenser was 10° F. When the flooding ceased, the temperature differential of the water across the condenser decreased slowly until the control system required the addition of steam to the circulating water to maintain the temperature of the batch in the reactor above the boiling point of the monomers. The minimum temperature of the cooling water entering the jacket of the reactor was 90° F; that in the jacket of the condenser was slightly lower. In Batch 14HGB5, in which 0.01 part of catalyst was added initially, flooding of the condenser still occurred, but the temperature differentials were smaller, and the maximum internal temperature of the batch was lower than those obtained in previous batches made according to the same formula.

Properties of Raw Polymer

When Lactoprene EV is produced in glass-lined or stainless steel equipment according to methods described for the 10-gallon polymerization unit, the resulting polymer is a white, opaque crumb, which yields water-clear and colorless dispersions in suitable organic solvents. When regular pilot-plant equipment with carbon steel latex transfer lines is used, however, the crumb tends to be yellow or brown. The feed lines to the 80-gallon glass-lined reactors are of stainless steel; the lines between the reactor and stripper are of carbon steel. The lines from the glass-lined stripper are also carbon steel.

Lactoprene EV crude crumb is dry and firm, exhibiting no noticeable tack at room temperature. It can be dispersed in the lower aromatic hydrocarbons, particularly benzene, yielding a water-clear product. The polymerization procedures described in this paper usually do not yield a completely soluble product. It is evident that a sizable gel fraction exists when the polymer is dispersed in acetone instead of benzene. Acetone is a good solvent for Lactoprene EV, but the cloudiness of

TABLE V—CHEMICAL TESTS ON LACTOPRENE EV

Polymer Batch No.	Product No.	Ash (%)	Combined emulsifier (%)	Gel (%)	Swell volume	Dil. solution visc.
14HGA1, 14HGA2, 14HGA3, 14HGA4	XP-101-L1	0.27	0.25	0	—	4.55
14HGA1, 14HGA2, 14HGA3	XP-101-L2	1.02	0	1.0	—	4.80
14HGB5	XP-102-L2	0.92	0.27-0.35	62	61	2.37
14HGB4	XP-103-L1	0.45	0.375	38	77	2.11
14HGB1, 14HGB2	XP-103-L2	0.44	0.30	44	83	2.97

acetone dispersions is indicative of appreciable gel content. The gel is not readily apparent in benzene dispersions because the refractive index of the gel fraction matches that of the benzene.

It is believed that the method of polymerization described in this paper, in which the reaction occurs substantially at reflux temperatures, usually produces side reactions leading to some branching and cross-linking of polymer chains. On the assumption, however, that side reactions occurring at reflux temperatures are likely to introduce excessive disorder in the polymer chains, with a resulting impairment in tensile properties, other methods of polymerization were tried *(3)*. These included solution polymerization and emulsion polymerization at low temperature. None of the polymers so prepared exhibited any significant improvement in tensile properties over those prepared by the method described in this paper. This appeared to be true even though soluble polymers having molecular weights ranging from 300,000 to 1,000,000 were obtained *(3)*.

Chemical Tests: As expected, because of the small amount of nonvolatile inorganic ingredients charged and the absence of a shortstop and antioxidant, the polymer contained low percentages of ash (0.3 to 1 percent). The low-solids Lactoprene EV contained little or no gel and had high dilute solution viscosity (4.5 to 4.8). The high-solids polymer exhibited a high gel content (40 to 60 percent) and a corresponding reduction in dilute solution viscosity. The gel was determined in accordance with the standard procedure used for GR-S. Table V shows the data for some of the runs in the 80-gallon polymerization unit.

Processibility of Polymer

Lactoprene EV, although essentially a polar polymer, can be handled on standard rubber processing equipment. It requires no initial breakdown on cold rolls. Although the crude product readily bands on warm rolls, the band is not smooth. The material does flow evenly if the mill temperature is sufficiently high. At this temperature, however, the polymer tends to split and go on both rolls. The best processing is obtained at about 160° F.

Some of the polymers prepared in the 80-gallon reactor (the XP series) were compounded with SRF and EPC blacks and compared with standard control stocks prepared from GR-S (X-387). Tables VI and VII give the compounding recipes used and the processing data obtained. Comparing Mooney viscosities, mill shrinkage roughness values and extrusion indices, one will observe that Lactoprene EV is processed about as readily as GR-S.

Although similar processing data for Lactoprene EV stocks containing HMF or HAF blacks are not available, judging from experience with these stocks on a 6 by 12-inch laboratory mill and in a Royle No. ½ extruder, one may expect an improvement in the processibility of Lactoprene EV paralleling that in GR-S processing obtainable with these furnace blacks.

TABLE VI—COMPOUNDING RECIPES USED IN COMPARATIVE EVALUATION OF LACTOPRENE EV POLYMERS (XP SERIES) AND GR-S (X-387)

Ingredients	Lactoprene EV		GR-S (X-387)	
	A	B	C	D
Polymer	100	100	100	100
SRF black [a]	50	—	50	—
EPC black [b]	—	50	—	50
Stearic acid	2	2	—	—
Tetramethyl thiuram monosulfide [c]	1	1	—	—
Triethyltrimethyl triamine [d]	variable [g]	variable [h]	—	—
Sulfur	2	2	2	2
Zinc oxide	—	—	5	5
Coal tar softener [e]	—	—	5	5
Mercaptobenzothiazole [f]	—	—	1.5	1.5

(a) Furnex. (b) Wyex. (c) Monex. (d) Trimene Base. (e) BRT No. 7. (f) Captax. (g) For XP-101-L2 and XP-103-L1, 1 part; for XP-101-L1 and XP-103-L2, 2 parts. (h) For XP-101-L1 and XP-103-L2, 2 parts; for XP-101-L2 and XP-103-L1, 2.5 parts.

TABLE VII—PROCESSING CHARACTERISTICS OF LACTOPRENE EV COMPOUNDS COMPARED WITH THOSE OF GR-S

Product No.	Recipe	Mooney viscosities: Raw polymer (ML-4)	Mooney viscosities: Compounded polymer (ML-4)	Mill shrinkage (%)	Roughness index	Extrusion index
XP-101-L1	A	53	71	—	20	9.5
	B		83	34	17	8.5
XP-101-L2	A	54	64	42	Too rough	11.5
	B		77	25	Too rough	11.5
XP-103-L1	A	58	46	46	148	10.0
	B		80	27	51	12.5
XP-103-L2	A	42	71	—	24	9.5
	B		92	30	17	8.0
GR-S X-387	C	51	50	50	131	9.5
	D	51	68	45	55	11.0

Vulcanization

As shown in Table VI, the amount of the basic curative, triethyltrimethyl triamine (Trimene Base), is variable. In certain cases, it is necessary to increase the amount of curative used to compensate for losses, presumably as a result of neutralization by acidic components in the mix; for example, hydrolytic products of the polymerization and acidic compounding ingredients. Considerable care should be given to the amount of amine curative employed in compounding recipes for evaluating the polymer itself.

With sulfur-cured compounds of other rubbers, minor variations in curing characteristics are normally compensated for by varying the curing time at a given temperature, thus establishing the tensile property-curing time relationship for a standard recipe. With acrylic elastomers, it is desirable, at least for preliminary work, to establish curing conditions by varying the amount of amine curative in the recipe. It is necessary to make only one cure (60 minutes at 298° F.) for each variation of the compound.

The concept of optimum cure for evaluation purposes is confused by the practical necessity of using larger amounts of amine (2 to 4 parts per 100 of polymer) to obtain technical cures giving maximum heat resistance. Whenever the molecular structure of the polymer is to be evaluated, it is expedient to cure to a state at which the ultimate tensile strength, that is the tensile strength per square inch, based on the cross-section of the specimen at break, is a maximum. Reversion in modulus and tensile strength occurs with some recipes, but it appears too slowly to be of value in fixing optimum cure. It is, of course, this resistance to reversion which makes this product a heat-resistant rubber.

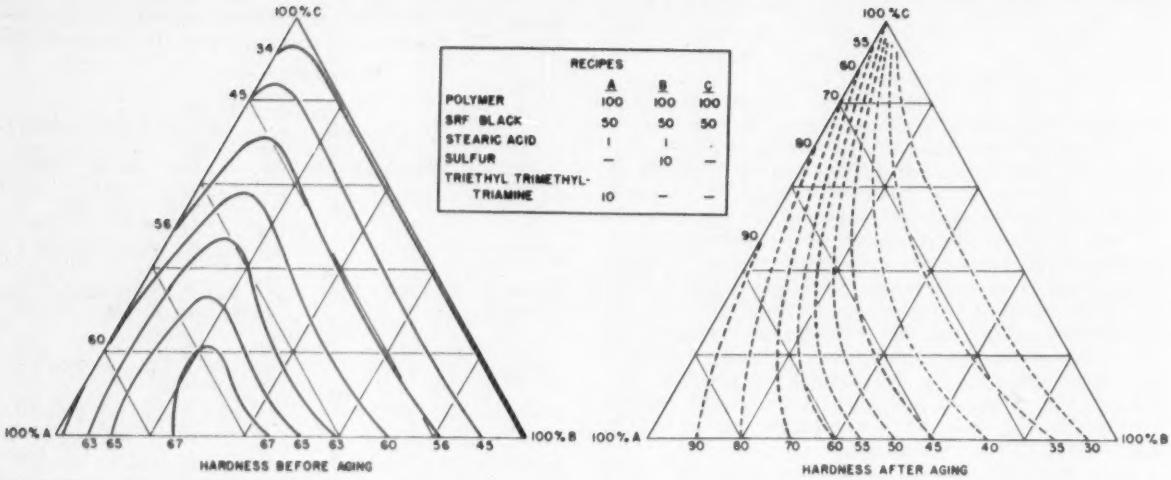

FIG. 8—Trilinear compounding chart for Lactoprene EV showing effect of curatives on durometer hardness before and after aging at 350° F. for 3 days.

The acrylic rubber recipes in Table VI contain both tetramethyl thiuram monosulfide and sulfur as curatives. These base recipes were an early development; more recently it has been shown that the tetramethyl thiuram monosulfide may be eliminated without adversely affecting the recipe. The sulfur, however, is apparently necessary for heat-resistant stocks. When used in conjunction with the amine, small amounts of sulfur accelerate the cure initially and retard aftercure or hardening upon subsequent exposure to heat. Figure 8 shows the effect of the amine and sulfur on initial cure and subsequent heat resistance at 350° F. In these graphs, the durometer hardness contours are plotted for green and aged vulcanizates from compounded stocks containing different amounts of sulfur and triethyltrimethyl triamine (Trimene Base).

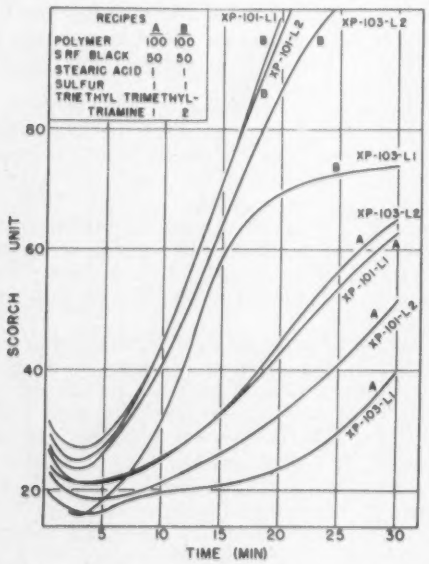

FIG. 9—Relative curing rates of the polymers studied as determined by scorch tests on Lactoprene EV.

The data show that (a) increasing amounts of amine curative in the recipe produce harder, more tightly cured vulcanizates, and (b) for a given amount of amine, increasing amounts of sulfur, up to roughly 1 part, appear to accelerate cure, whereas larger amounts have little effect on initial cure. Further examination of the data reveals that small amounts of sulfur have an abnormally large influence in reducing the resulting hardness of the aged vulcanizates. This observation is more evident in the case of low-amine recipes. In fact, by choosing the proper relative amounts of sulfur and amine, say 1 of sulfur and 4 of amine, one obtains a vulcanizate which has the same hardness after aging as initially. These data have proved to be basic information aiding the development of heat-resistant Lactoprene EV compounds.

Scorch tests were made on the polymers in the XP series; a standard recipe was used in which only the amount of triethyltrimethyl triamine was varied. The tests were made in a Mooney viscometer, the MS rotor was used, and the viscometer temperature was maintained at 302° F. (150° C.). Each test was timed from the instant the viscometer cavity was closed.

It will be observed from the data in Figure 9 that when 1 part of curative was used, XP-101-L2 and XP-103-L1 appeared to cure more slowly than either of the other two polymers. When the amount of curative was increased, however, XP-101-L2 cured as rapidly as XP-101-L1. Further, XP-103-L1 exhibited rapid curing up to a point where it failed in the viscometer. Thus, it appeared from the scorch data that the curing characteristics of XP-101-L1, XP-101-L2 and XP-103-L2 were approximately equivalent but XP-103-L1 did not attain an equivalent state of cure. The apparent relatively high curing rates of XP-103-L1 (Recipe B) and XP-103-L2 (Recipe B) are possibly misleading because the high gel content (Table V) could augment cross-linking due to vulcanization.

Physical Properties of Vulcanizates

The physical properties of Lactoprene EV vulcanizates have been described elsewhere *(1, 2, 7, 8, 11)*, and it is not within the scope of this paper to consider them in detail. Their outstanding properties include exceptional resistance to heat, oil, light, and oxygen. Such properties as tensile strength, elongation, compression set resistance,

TABLE VIII—TENSILE PROPERTIES OF LACTOPRENE EV VULCANIZATES

Recipe		A	B	C	D	E	F	G	H	I	J
Polymer											
XP-101-L1		100	—	—	—	—	100	—	—	—	—
XP-101-L2		—	100	—	—	—	—	100	—	—	—
XP-103-L1		—	—	100	—	—	—	—	100	—	—
XP-103-L2		—	—	—	100	—	—	—	—	100	—
X-387		—	—	—	—	100	—	—	—	—	100
SRF Black		50	50	50	50	50	—	—	—	—	—
EPC Black		—	—	—	—	—	50	50	50	50	50
Stearic acid		2	2	2	2	—	2	2	2	2	—
Tetramethyl thiuram monosulfide		1	1	1	1	—	1	1	1	1	—
Triethyltrimethyl triamine		2	1	1	2	—	2	2.5	2.5	2	—
Sulfur		2	2	2	2	2	2	2	2	2	2
Zinc oxide		—	—	—	—	5	—	—	—	—	5
Softener (BRT No. 7)		—	—	—	—	5	—	—	—	—	5
Mercaptobenzothiazole		—	—	—	—	1.5	—	—	—	—	1.5
Properties	Cure at 292° F.										
Tensile strength, lb./sq. in.	30 minutes	1670	1420	450	1600	1850	1170	1450	720	700	1980
	60 minutes	1650	1540	660	1690	1920	1420	1810	890	1040	3100
	120 minutes	970	1510	880	1660	1820	1950	1960	1070	1700	3210
	240 minutes	1680	1590	1010	1650	1830	2140	1990	1270	2000	3020
Ultimate elongation, %	30 minutes	300	720	870	370	810	740	540	520	850	500
	60 minutes	290	640	740	330	660	630	530	470	740	540
	120 minutes	170	580	620	300	590	580	380	400	610	440
	240 minutes	250	490	460	240	620	470	430	370	500	370
Modulus at 300% elongation, lb./sq. in.	30 minutes	1670	600	380	1380	510	610	930	730	490	750
	60 minutes	—	790	510	1630	800	780	1190	900	660	1310
	120 minutes	—	850	680	1660	860	1030	1420	1070	960	2030
	240 minutes	—	1060	900	—	830	1390	1590	1260	1310	2230

and hot tear resistance *(2, 3, 8, 17)*, although not outstanding, are acceptable for most specialty applications.

Table VIII gives representative tensile properties of the polymers described here. These results were obtained from work conducted at the Government Laboratories *(1)*, which included data on hot tensile properties and heat resistance not reported here. The curing recipe was one used in earlier work, that is, the sulfur-tetramethyl thiuram monosulfide-triethyltrimethyl triamine recipe, which already has been discussed. The sulfur-triethyltrimethyl triamine recipe is a later one; the amount of triethyltrimethyl triamine used gives maximum heat resistance (Figure 8). In general, the amount of amine used to obtain a given state of cure is a function of the amount and type of black in the recipe. Care should be taken to make comparisons only on the basis of equal states of cure; comparing vulcanizates having equal moduli is adequate provided the amount and type of loading are constant.

Applications

Although vulcanizable polyacrylates are comparatively high in cost, these materials are rapidly claiming a permanent position in the field of specialty elastomers. Increased production may be expected to lead to substantial price reductions. At present, where heat resistance is of paramount importance, the ethyl acrylate copolymer, Lactoprene EV, is superior to the best butadiene-acrylonitrile rubbers by a factor roughly 5. Although nitrile rubbers exhibit better low temperature resistance than does this acrylic rubber, the advantage appears to be potentially with the acrylic rubber because changes in compounding can often compensate for deficient low temperature properties, whereas inferior heat resistance is difficult to circumvent. Although the heat resistance of Lactoprene EV cannot compare with that of silicone rubbers, the advantage is likely to be in favor of the acrylic rubber when high degrees of oil resistance and compression set resistance are also required.

The only acrylic rubbers commercially available (so far as the authors are aware) are the Hycar PA series, two of which, the PA21 and PA31, are basically similar to Lactoprene EV. These rubbers are being introduced in numerous industrial applications in which prolonged resistance to heat is important. Figure 10 shows industrial experimental products containing Lactoprene EV or similar base copolymers.

Summary and Conclusions

Production of Lactoprene EV by the emulsion polymerization method under reflux conditions at atmospheric pressure or slightly higher is fairly simple. A product is obtained that can be used in latex form, or

FIG. 10—Molded and extruded acrylic rubber specialty items, including O-rings, flat gaskets, molded sheets, tubing, blown sponge, etc.

with additional processing, in solid raw polymer form. The reflux system affords a convenient method of eliminating most of the heat of reaction from this rapidly polymerizing system. No "shortstoppers" or antioxidants are required. The reaction is rapid and goes to about 95 percent completion. The monomers, being liquids at room temperature, do not require pressure equipment for storage.

The polymer produced is of high molecular weight, versatile in its methods of vulcanization, and has some outstanding properties. The most important of these are its resistance to dry heat, sunlight, oxygen, ozone, and oil; it also has excellent flex life and cut-growth resistance. In addition, white and pastel shade stocks can be compounded and vulcanized.

As the properties of this elastomer become better known and its cost decreases, demands for it will greatly increase.

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Flexible Rubber Bags Finding Application in Medical Field

A FLEXIBLE cast that hardens instantly and can be used over and over for more comfortable and efficient immobilization of patients undergoing X-ray and other types of medical treatment is now in use in cancer clinics. The device, made by the Dewey and Almy Chemical Co., Cambridge, Mass., and known as Flexi-Cast, is also a flexible mold, and is also being used to make instant impressions for plaster casts and for other radiotherapeutic purposes.

Flexi-Cast consists of a thin-walled rubber bag filled with fine-grained plastic granules. A vacuum pump is attached by means of a rubber tube. The bag can be manipulated to fit closely around any part of the human body or all of it. When the bag is adjusted, the pump turned on, and the air withdrawn, the bag instantly becomes rigid and rock hard. Although the patient feels no pressure or discomfort, the part of his body surrounded by the bag cannot be moved until the vacuum is released. When only part of the air is withdrawn, the bag is malleable and can be molded like putty. Employment of the flexible cast eliminates the bother and discomfort of straps, sandbags and other cumbersome devices used previously, and is said to be faster and more effective for doctors in their work.

Used as a cast, to immobilize a patient undergoing radiotherapy, the portion of the body to be treated—the patient's head, for example—is placed upon the bag and accurately positioned so as to receive the X-ray beam in the precise spot of cancerous growth. The bag is then manually molded or built up around, but not covering, the patient's face. When the air is exhausted, the bag immediately becomes rigid without losing its molded shape, and the patient cannot move his head. He feels no sense of restraint during the process, and usually is unaware that the bag has become rigid until he tries to turn his head. Bags of varying sizes and shapes are used to immobilize or support different parts of the body, including a full length bag which can "freeze" the entire body.

When used as a mold, the device provides a faster, cleaner method of making negative molds or impressions of the face, head and other parts of the body. In making a facial mold, the bag is pressed momentarily over the patient's face, and the air is withdrawn. When removed from the face, the result is a negative mold into which plaster of paris is poured. Within 10 to 15 minutes, the plaster has hardened. Then the vacuum is released and the bag falls away, leaving a model of the face. While fine details are not reproduced, the device does provide a quick and accurate cast showing the bony structure and facial contours. Such casts are used as an aid in calculating and aiming the X-ray beam.

Editorials . . . . . .

Season's Greetings

AS Father Time nicks off another year in the current century it gives us the opportunity to once again express our appreciation to the industry of which we are a part and to extend best wishes to our readers for a Merry Christmas and a Happy New Year.

THE PUBLISHERS

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Disposal Formula

ACCORDING to the terms of the Rubber Act of 1948, a report on suggested disposal of the government-owned synthetic rubber producing facilities must be submitted by the Reconstruction Finance Corporation to the President by March 1 of next year and, under Congressional directive, the President in turn is required to submit his recommendations on such disposal to Congress by April 15, 1953. These columns have made frequent reference to these directives and to some of the steps being taken by RFC officials to prepare the required report. The reaction of the industry to these steps has also been commented upon from time to time. The RFC officials have made no effort to cover up the steps taken, although no official statements have been issued as to the progress being made.

It has also been no secret that the Rubber Industry Advisory Committee has been seeking a formula of its own to present to government officials in connection with the disposal of the synthetic facilities. Recently it was learned that a 14-page document under the title of "Plan for the Disposal of the Government-Owned Rubber Producing Facilities to Private Industry" was submitted by the Advisory Group to RFC Special Deputy Morton E. Yohalem, who is charged with preparing the disposal report. Although copies of the report have not been made available to the general press, sufficient inklings have leaked out to give a fairly good picture of the industry's point of view on the subject of disposal.

After outlining the objectives of the plan, designed to be practical and acceptable to both government and industry, the report discusses each of these objectives in turn, among them being national security, adequate protection of small industry, protection of the national investment, and conformity with Congressional mandates. It is not too surprising to find that many of the suggestions made are somewhat in favor of industry, and it is exceptionally doubtful that RFC, or any of the other government agencies involved in the over-all rubber picture, will go along with some of them in the final analysis. Many of the suggestions closely follow the pattern of industrial testimony before the various Congressional hearings which have been held in the past few years, particularly those held in 1948.

For example, the report points out that although the government should obtain a "fair and equitable" price for the facilities, the price in itself should not be emphasized above all else, since it might limit to an unwise degree "the number and size of prospective purchasers." This comment is tied in with the fact that the terminology of the Rubber Act indicates that "there shall be maintained at all times in the interest of national security and common defense a technologically advanced and rapidly expandable rubber producing industry in the United States." In this connection, the report suggests that great strides in improvement of both polymers and end-products lie ahead "if the plants are sold to those best able and most interested to develop them further."

The report is somewhat more definite on the terms which should be allowed once a price has been established, on a negotiated rather than a sealed bid basis. The Advisory Group suggests that the purchaser make a down payment of 10% on or before the actual date of transfer of the plant, with the balance of the purchase price secured by a 10-year first mortgage bearing reasonable interest. The balance would be liquidated by the payment of a set amount for each ton of synthetic rubber produced, the amount being computed on a mathematical basis over the ten years involved. The government is asked to postpone payments, at the purchaser's option, during periods when the plant may be shut down, with the aggregate postponement of payments not to exceed two years. If payments are not made in accordance with this over-all formula, the government is given the right to repossess the facilities.

These are but two facets of the suggested disposal plan advanced in the Advisory Group report, but they seem indicative of the fact that rubber manufacturers are not yet quite ready to take over the polymer facilities without some very definite safeguards. Presumably this is good accounting and business procedure, but it seems to us that the future of synthetic rubber is well enough assured to waive some of these "safeguards." In any event, despite the seeming bias in the report it should serve as an excellent talking point for the eventual negotiators.

NEWS OF THE MONTH

DECISION NEARING ON SYNTHETIC PLANT SALE AS WORLD NATURAL CONSUMPTION DECLINES

ACCORDING to trade reports, Congress will soon decide whether the country's synthetic rubber industry should be turned over to private business. During the past six years, Congressional bodies have consistently backed turning over the synthetic plants to private industry when national security permits. Foreseeing the nearing of that time, Congress gave industry and government a "go ahead" signal to prepare detailed plans for turning the plants over to industry. Accordingly, the rubber industry's advice was sought, and a ten company group submitted to the Reconstruction Finance Corporation a 14-page report detailing the manner in which it would like the plant disposal handled. After four months of secrecy, details of the report have become known. In its report, the industry group urged: (1) that a majority of the synthetic plants be sold to rubber companies; (2) that sales be based on negotiations rather than strictly competitive sealed bids; and (3) that guarantees by the companies of continued synthetic production be extended five years, and possibly dropped in 1957.

The industry group report also states that those plants unsold the first time around should be reoffered only to those companies with proven "know-how" for the operation of the plants, adequate technical staffs with the background of long experience in the advancement of the technology of synthetic rubber and capacity to consume synthetic rubber. This would assure national security, the report stated.

Trade sources report that these recommendations have met with a cool reception thus far. Some smaller companies contend that these suggestions, if followed, would put the larger companies in an invincible bargaining position, since very few firms in the rubber industry are able to meet these qualifications.

Wider Participation Sought

Both the Department of Justice and Congress have directed RFC to strive for wider participation, particularly of small firms, in synthetic rubber plant operation. Smaller companies complain that if the industry suggestions were followed, the bulk of the synthetic plant capacity would go to the larger firms in the industry.

In addition to the problems posed by synthetic plant disposal, Congress and the present administration are showing concern over the fact that synthetic rubber is becoming so popular it is presenting a serious challenge to natural rubber.

World production of natural rubber amounted to 127,500 tons in September, according to estimates of the Secretariat of the International Rubber Study Group. The January-September 1952 total reached 1,287,500 long tons, a decline of 8.5 percent from the 1,407,500 reported in the similar period a year ago.

Consumption of natural rubber in September was estimated at 117,500 tons, bringing the cumulative 1952 total to 1,072,500 tons, down 6.3 percent from the January-September 1951 total of 1,145,000 tons. Estimated imports into Russia and China included in the foregoing figures amounted to 8,500 tons in September 1952, 112,250 tons in January-September 1952, and 114,000 tons in January-September 1951.

Stocks of natural rubber (excluding stocks in China and Russia, and Government stocks in the United States, the United Kingdom and France) were placed at 730,000 tons at the end of September, compared with 812,500 tons on January 1. The September stocks included 240,000 tons in producing countries, 307,500 tons in consuming countries and 182,500 tons afloat. The January 1 position was 242,500 tons, 315,000 tons and 255,000 tons, respectively.

Excluding Russian operations, world production of synthetic rubber was estimated at 65,000 tons in September 1952, and consumption at 72,500 tons, while stocks at the end of September were placed at 165,000 tons, up 22,500 tons from January 1. The cumulative figures for 1952 were production 670,000 tons, consumption 652,500 tons; for 1951, 66,000 tons and 602,500 tons, respectively.

In the first nine months of 1952, world consumption of natural and synthetic rubber totaled 1,725,000 tons, compared with 1,747,500 tons in the same period of 1951. United States consumption increased to 917,250 tons from 913,500 tons, while foreign consumption, excluding China and Russia, declined to 695,500 tons from 720,000 tons.

Harry A. McDonald, administrator of RFC, stated recently that industries are showing a "growing preference" for cold rubber. Advance orders through next March indicate that rubber consuming industries will buy more "cold" and less "hot" rubber from RFC.

Mr. McDonald said that synthetic plants will sell at least 316,000 tons of GR-S in the last three months of this year and the first three months of 1953. Of that total, 55% will be cold rubber and the remaining 45% "hot" rubber.

E. Dorrance Kelly, director of the Office of Synthetic Rubber of RFC, said that the RFC has been and is able to meet the entire demand for synthetic rubber, except for a few special types. He noted that November would total the heaviest demand to date for synthetic latex. Requirements were about 9,500,000 pounds, or 1,500,000 pounds higher than the average of the past six months.

It was also recently revealed by RFC that the American taxpayer has $278,000,000 of his war bond dollars invested in the government's synthetic rubber program. Also released was a profit and loss accounting for the 1952 fiscal year. This year's synthetic rubber profits are estimated at $25,000,000 or higher, exceeding the previous year's $16,000,000. The overall profit for the eight fiscal years beginning with 1947 is $8,000,000. The $8,000,000 was profit after allowance for local taxes, although no federal income taxes were paid. The profit figure also took into account wages, research, an emergency fund, interest payments on borrowed capital, and full depreciation.

Fiscal 1952 Depreciation

Depreciation as of June 30, 1952, totals $338,000,000. Since the changeover to break-even operation, all but $173,000,000 of the original investment in the plants has been written off. This investment has been paid off as part of the price of synthetic products billed against tiremakers and other customers for synthetic. But RFC has also decided to pay off some $112,000,000 of depreciation left over from the subsidized wartime days.

Although Congress has said that RFC may forget these uncharged accounts, RFC decided to work them off with its postwar profits. So the $8,000,000 of the postwar profit has been subtracted from the $112,000,000 of wartime depreciation charges, leaving $104,000,000 still owing on the old accounts. RFC adds this $104,000,000 of

old bookkeeping debts to its $173,000,000 still to be amortized. The result is the $278,000,000 called the taxpayers' investment in the program.

The Office of Synthetic Rubber is now offering optional export packages for the shipment of GR-I. The exporter can obtain GR-I in the same type of box used for domestic shipments at the usual domestic price (20.75c per pound, plus the uniform freight charge) or, alternately, he can obtain GR-I in a special export box by paying a special premium.

Most domestic GR-I is shipped film wrapped, in a sleeve-type box. The export version of this box is made with waterproof liners and adhesives. Film wrapped GR-I can be purchased for export in the special export carton for the domestic price plus a premium of 3/10ths of a cent a pound.

A small percentage of domestic GR-I is shipped without a film, in a coated carton (the "CC" grades). The export version of this box is made with waterproof liners and adhesives. The "CC" grades can be obtained in this special export carton for a premium of ½ of a cent per pound over the domestic price. Orders for GR-I packed in the aforementioned special export cartons should be submitted at least 30 days in advance of desired shipping date.

For exporters who desire shipments of GR-I in an export package on short notice, an outer supporting wooden crate is available. GR-I, in domestic cartons can be packaged in this crate for extra support of the package. GR-I packed in this manner is available to shippers at a premium of 8/10ths of a cent above the domestic price. RFC will furnish further information regarding these export packages on request. Purchase orders for export shipments should specify the type of package desired.

Plan Appeal of Decision

A score of tire companies plan to carry to the U. S. Court of Appeals their fight to invalidate a Federal Trade Commission ruling placing a quantity limit on discounts which tire manufacturers may grant in selling replacement tires and tubes. The appeal was indicated by company attorneys after a Federal District Judge handed down a decision recently vacating an in junction against the FTC ruling which was granted to the companies in March.

The commission's ruling, the first under the quantity limit proviso of the Robinson-Patman Act, was issued last January to take effect April 7. The ruling will go into effect automatically unless the companies receive another stay pending an appeal.

The Judge ruled that the companies were acting prematurely in seeking invalidation of the ruling by the courts. He said they have a "plain, adequate and complete remedy" in government enforcement proceedings to test the validity of the ruling. Any company can make that test, he said, by violating the ruling after it goes into effect. In bringing an enforcement action, FTC would have to prove in court that the company's discounts lessened competition among tire dealers and tended toward monopoly.

Pakistan to Grow Rubber

Pakistan has entered upon a program to grow natural rubber according to a recent announcement. For that purpose, 1,000 rubber tree seedlings are presently being imported from Malaya for cultivation in the districts of Chittagong and Sylhet. Earlier, the Pakistan Forest Department reported successful experiments with over 200 seedlings in an area whose climatic conditions very much resemble Malayan forests.

The manufacturers who were joined in their motion to kill the ruling by 35 Chicago area tire dealers, said the Administrative Procedures Act permitted judicial review of any final action by an agency. The Judge said promulgation of the tire limit ruling was not a "final act" by the agency. Any effort to enforce the ruling would be, however, he said.

The FTC tire limit ruling restricts quantity discounts to a maximum of a single 20,000-pound carload. Under the ruling, a dealer who orders a single carload over a year can get the same discount as another dealer buying many carloads.

According to the companies, the FTC ruling, if upheld, will result in higher consumer prices for tires and tubes by forcing sharp slashes in current discounts granted to larger distributors. The ruling would force tire manufacturers to revamp their price structure from an annual volume basis to a quantity basis. The industry now grants discounts on the basis of annual dollar volume purchased. FTC attorneys were silent on whether if the tire companies appeal to a higher court, as they appear certain to do—the commission will agree to another stay in putting the ruling into effect.

The Judge's decision was lauded as a "signal victory for all independent retailers in the rubber tire industry" in a statement issued by George J. Burger, vice president of the National Federation of Independent Business. The National Association of Independent Tire Dealers said the decision "tends to support our original position that the ruling ought to be allowed to work; only if it's given a chance to work can we tell whether it is a just ruling".

NAITD, which started the FTC investigating tire discounts, sought an annual dollar volume limit of $600,000, a more liberal curb than finally promulgated by the agency. Some NAITD members have joined the manufacturers in opposing the present ruling.

Other news on tires came from the Office of Price Stabilization in Amendment 1 to SR 118, GCPR, dated November 13, 1952. The effect of this amendment was to make the ceiling price of second line low pressure tires 75% of the manufacturers' or brand owners' ceiling prices to all their various classes of purchasers for the same size first line low pressure tires.

Individual manufacturers' ceiling prices have been substituted for dollars-and-cents ceiling prices on technical grade carbon tetrachloride when sold for making certain specified refrigerants, OPS also announced on November 14. The individual ceiling prices which have been placed on sales of carbon tetrachloride for use in the manufacture of refrigerants are the ceilings that sellers had established on that type of sale under the Manufacturers' General Ceiling Price Regulation (CPR 22). The change is provided for in Amendment 9 to Supplementary Regulation 7 to CPR 22.

Amendment 8 to SR 7, CPR 22, which became effective July 12, 1952, established a ceiling price of $0.0772 per pound on spot sales in tank car lots of carbon tetrachloride, technical grade. The term spot sale was meant to include sales made at scheduled or list prices. Amendment 8 provided that ceilings on other types of sales be established by applying differentials determined in a prescribed manner to the spelled out ceiling price.

OPS has now found that it was inappropriate to relate the ceiling prices on contract sales to the ceiling of $0.0772 specified in Amendment 8. Because of the corrective nature of the new amendment, the authority to use manufacturers' individual CPR 22 ceilings on sales of carbon tetrachloride sold for the manufacture of halogenated hydrocarbon refrigerants was made retroactive to July 12, which was the effective date of Amendment 8.

OPS, on November 5, extended the time in which certain machinery manufacturers may choose an optional method of calculating increased ceiling prices under the Capehart amendment to the Defense Production Act. The optional method is provided for under Supplementary Regulation 8 to Ceiling Price Regulation 30 to meet the special needs of machinery manufacturers turning out custom designed and fabricated commodities.

SR 8 (subparagraph 2 of section 9b) provided that on and after November 6, 1952, a manufacturer could not sell any formula-priced commodity or service covever by SR 8 at a ceiling price established either under SR 4 or SR 5 to CPR 30. (SR 4 and SR 5 to CPR 30 are the procedural regulations for calculating Capehart adjustments.) This date has now been extended to December 15, 1952.

Further Amendments Expected

A further amendment to SR 8 will be issued which will make it clear that the use of SR 8 is optional, OPS officials said. The later date is provided in order to give these manufacturers more time for making an election and for filing reports and obtaining the necessary authorizations. The new action is covered by Amendment 1 to SR 8 under CPR 30, effective November 5, 1952.

Removal of limitations on the use of sulfur and elimination of sulfur inventory controls were announced on November 5, 1952 by Thomas C. Keeling, Jr., Director of the Chemical Division of the National Production Authority. The action revokes NPA's Sulfur Order, M-69. The order, as amended January 1, 1952, restricted sulfur use to 90 percent of 1950 usage and provided for full support for certain defense and essential civilian requirements.

ANTI-TRUST SUIT AGAINST DUPONT GETS UNDER WAY IN FEDERAL COURT

The long-heralded anti-trust suit against the du Pont family, E. I. du Pont de Nemours & Co., Inc., the General Motors Corp., and the U. S. Rubber Co., got under way on November 18 in Federal Court at Chicago, Ill. The suit is a civil action, originally filed on June 30, 1949. The government charges that Pierre S. du Pont, Irenée du Pont, and 115 of their relatives by blood and marriage, as well as E. I. du Pont de Nemours & Co., General Motors and U. S. Rubber, and three lesser known firms, the Christiana Securities Co., the Delaware Realty Investment Co., and the Wilmington Trust Co., conspired to stifle competition through a monopoly.

The defendant individuals and organizations have denied the government's charges and assert that the government is basing its attack merely on "bigness" as such. Involved are assets of more than $5,000,000,000. The government's principal objective in the trial, being heard by Judge Walter J. La Buy, is to force DuPont to dispose of its vast investments in General Motors, consisting of 20,000,000 shares of stock with a current market value of more than $1,000,000,000.

The court is also being asked by the prosecutor to break up other DuPont interests by forcing members of the family to sell all their stock in U. S. Rubber and to cancel all existing contracts between the chemical, rubber, and the automobile interests.

In the opening days of the trial, defense attorneys assailed the charge of a family "conspiracy" as absurd. They said that the government was forced to resort to the charge because stock in U. S. Rubber is held by individual du Ponts and a common control point had to be found. They hammered at the suit's inclusion of fifty-nine children as defendants, saying some of them were in the "nursing stage" when the complaint was filed.

Pattern of Control

Government attorneys attempted to sketch a pattern of control which, they said, first extends to the Delaware Realty and Investment Corp. This is a personal holding company in which families of the nine du Pont brothers and sisters hold almost 100% of the voting stock. Delaware Realty, in turn, owns one-third of the voting stock of the Christiana Securities Co. The individual du Ponts also hold directly or in trust another block of about a third of Christiana.

Christiana, in turn, holds more than 3,000,000 shares of DuPont company stock. Delaware Realty has about 300,000 more and the individual defendants hold about 500,000. Altogether, this is about 35% of the DuPont stock, enough for "unquestioned and complete control," the government attorneys said.

DuPont, for its part, owns about 23% of the stock of General Motors. With the rest of General Motors stock scattered, this is enough for control, they said. Members of the family, meanwhile, hold 18% of U. S. Rubber stock, also allegedly enough for control.

Rubber Football Use Growing

Coaches consenting, the rubber-clad football has now been accepted as official by the National Collegiate Athletic Association and all other leading sports organizations. It is estimated that the rubber football will be used this season ten times as often as last year—which is to say, in 10,000 games. The rubber football had its debut in major conference games in October, 1951. Identical in looks and appearance with the "pigskin", seamless, but studded with small "bumps" for better wet-weather gripping, the rubber ball is said to have as its chief virtue its resistance to water and water-logging. It is also said to offer greater economy than the "pigskin".

The government attorneys said it was impossible to show the links of the Wilmington Trust Co. because of "lines of power" running in every direction. The trust company, it was asserted, is used by the family to hold large blocks of stock, including about half of the family holdings of U. S. Rubber stock.

The government's inclusion of minor children in the case was defended with the claim that they play a vital role in the over-all operation of the scheme of control. The senior members of the family follow a policy of transferring holdings to minors in various ways, the government charged.

DuPont attorneys, in answering the government charges, cited instances where the company failed to land General Motor's business to show that no special privileges existed for DuPont because of family stock holdings. It was argued that DuPont gets business like any other firm—by offering a better product, better service and lower prices.

The "guts" of the law suit, they said, is the trade relations between the companies, pointing out that the stock relations between companies and individuals has been well known in the case of General Motors since 1917, and since 1927 the public has been aware that members of the du Pont family held stock in U. S. Rubber.

They referred to DuPont's development of nylon, cellophane, plastics, synthetic rubber, and ethyl gasoline as further proof of the company's aggressive competitive management.

Other Details Revealed

During the course of the trial it was revealed that in 1931, Charles E. Wilson, now president of General Motors and recently appointed Secretary of Defense by President-Elect Eisenhower, negotiated a contract under which General Motors agreed to buy 50% of its tire supplies from U. S. Rubber. The government has alleged that General Motors shifted its tire business to U. S. Rubber in furtherance of a "combine."

Defense attorneys denied this charge and related the events leading to the rubber pact. It was stated that in 1929, Mr. Wilson was given the task of acquiring or disposing of manufacturing plants. In 1930, General Motors had to consider whether or not to go into the manufacture of tires, as the Ford Motor Co. had done. A committee was appointed and Mr. Wilson, then a vice-president, investigated all the tire companies.

Mr. Wilson decided that only two, the Kelly-Springfield Tire Co. and U. S. Rubber, were suitable for purchase by General Motors. He concluded, however, that it would be a mistake to buy any rubber company and recommended instead that General Motors buy rubber and cotton at current market prices and pay someone else to make the tires.

Since this arrangement promised lower tire costs, Mr. Wilson was given a go-ahead signal by Alfred P. Sloan, then chief executive of General Motors. Goodyear Tire & Rubber Co. turned down the proposal, the Firestone Tire & Rubber Co. had the Ford business, and U. S. Rubber submitted a lower bid than the B. F. Goodrich Co.

An agreement then was reached with U. S. Rubber providing for a price formula relating to current costs of rubber and cotton rather than the higher costs at which tire manufacturers had purchased large stocks. Later, when the price of rubber stabilized, the purchase pact was put on a straight contract basis, the attorneys stated.

Deny Government Charge

Attorneys for U. S. Rubber pointed out that for many years Irenée du Pont maintained that the company should get out of the tire business. This, attorneys said, was squarely inconsistent with the government charge that a du Pont family syndicate tried to make U. S. Rubber supply most of the tires needed by GMC. The government has described Irenée du Pont as a "moving figure" in the alleged syndicate, and contends that upon the election of F. B. Davis as board chairman and president of U. S. Rubber in 1929, the du Ponts gained absolute control over that company.

Mr. Davis took over the company's leadership shortly after the du Pont family bought a large share of U. S. Rubber stock. The government contends that Mr. Davis was the du Ponts' representative. U. S. Rubber attorneys, in answer, stated that the government "relies on implication" to prove its allegations that du Pont individuals dominated U. S. Rubber and bought control of the company to create a "captive market" for tires with General Motors.

They further stated that the du Ponts never had any actual control of U. S. Rubber, emphasizing the fact that only eight of the forty-five men who have served on the company's board of directors since Mr. Davis was made an executive were nominees of du Pont individuals.

In other trial testimony, the government cited a 1927 attempt by DuPont to halt GMC research for synthetic rubber. The government charged that the late Lammot

du Pont used his influence with General Motors to stifle experiments conducted by Charles F. Kettering. This, said government attorneys, may have cost the United States many years in the discovery of an "invention" that proved vitally important during World War II.

DuPont attorneys conceded that Lammot du Pont attempted to discourage General Motors from synthetic rubber research. It was contended, however, that Mr. du Pont's feelings were ignored by General Motors and the research continued for some time.

A letter from Lammot du Pont to John J. Raskob, an official of General Motors, was the basis for the government's charge. At that time, Mr. du Pont was a member of the General Motors' Finance Committee. In the letter, Mr. du Pont wondered if it was a wise expenditure on the part of General Motors to go into synthetic rubber research. He went on to say, according to the government brief, that the DuPont company was better equipped to study this field and that it was a useless waste of money for General Motors to duplicate its work.

On November 25, the government announced that it would ask for a continuance of the trial until January 5, 1953, because of the illness of the government's chief prosecutor, Willis L. Hotchkiss. Mr. Hotchkiss has been in charge of the DuPont action since the original investigation in 1948.

Leviton Found in Violation

Leviton Manufacturing Co., Inc., Brooklyn, N. Y., has been found to have unlawfully used more controlled materials than was allotted to it and to have violated inventory restrictions. Accordingly, the National Production Authority has issued a suspension order against the firm. Bernard I. Leviton, vice-president of the company, also was found to have violated NPA orders and regulations. Evidence showed that the firm, between January 1, 1951, and June 30, 1951, used 463,607 pounds of copper and copper base alloys in excess of the amount authorized. It was also ruled that the company had exceeded its permitted inventories of copper strip, brass strip, brass wire, brass rod, bronze strip, carbon steel strip and carbon steel wire during the period January 3, 1952, and April 10, 1952. The suspension order requires that the company repay an equal amount to the 463,607 pounds of copper and copper base alloys which it used illegally. It was also directed that Leviton cancel all outstanding purchase orders for the controlled materials, the receipt of which would bring inventories above authorized levels. It was further directed that the company and Mr. Leviton be prohibited, during the fourth quarter of 1952, from acquiring any items of copper and copper base alloys for the production of certain items, in excess of their allocations and allotments. The suspension order stipulated the firm must not accept any items of copper strip, brass strip, brass wire, brass rod, bronze strip, carbon steel strip and carbon steel wire if such acquisition would violate inventory restrictions. No evidence was found establishing wilful violations, NPA said.

ANNUAL MACY'S THANKSGIVING DAY PARADE FEATURES GOODYEAR BALLOONS

Shown above is the "Dragon," 60-foot balloon constructed by Goodyear for the annual Macy's Thanksgiving Day Parade. Goodyear employees standing near the giant balloon give some idea of its size.

Rubber balloons, fabricated by the Goodyear Tire & Rubber Co., featured this year's Thanksgiving Day Parade, sponsored by R. H. Macy & Co. Among the balloons in this year's parade, was the "Dragon," a 60-foot long replica of a fictional prehistoric monster. Thirty-five feet wide from flipper to flipper, the "Dragon" stands 24 feet off the floor at the top of the skull. Another of the balloons in the parade was "Space Man," an artist's conception of a visitor from another planet. Measuring 70 feet from head to toe, "Space Man" spans 40 feet from side to side. Approximately 14,700 cubic feet of helium are required to inflate this balloon. The rubberized fabric of which the balloons are constructed must be painted while the balloons are inflated, to insure that colors are placed in the proper places. About 25 gallons of paint are required to cover "Space Man." Despite their immense size, both of these balloons were moved about with ease.

AMF-Oakes Terminate Agreement

Termination of the manufacturing and sales agreement on Oakes mixers which existed between the American Machine & Foundry Co. and the E. T. Oakes Corporation, as of October 31, has been announced by both companies. The agreement was entered into by AMF and Oakes in October, 1948, whereby AMF was granted exclusive manufacturing and sales rights to the Oakes mixer in the United States and Canada with the exception of sales to the confectionery industry.

According to F. R. Plum, divisional vice-president of AMF's bakery division, AMF will continue to maintain a complete stock of spare parts for the Oakes mixers, which are widely used in the production of foam sponge, and "have available competent, trained service personnel to meet the requirements of all users who purchased their Oakes mixers from AMF or who now hold AMF leases." Mr. Plum also stated that the termination agreement permits AMF to make immediate delivery on a number of standard Oakes machines still in stock. It is also believed that AMF will continue to be active in the foam sponge field with a specially-designed machinery line of its own.

In the announcement of the termination issued by the E. T. Oakes Corp., Dr. Earle T. Oakes, president, expressed satisfaction with the arrangement initially made with AMF and indicated that it was ended because the facilities of the Oakes Corp. had now expanded to the point where it could produce and distribute the Oakes mixer on its own. The company has already introduced a smaller unit of the continuous mixer with a capacity about half of the standard model. The E. T. Oakes Corporation maintains headquarters at Commack Road, Islip, L. I., N. Y.

Naugatuck Marvinol VR-21

Development of a new vinyl resin specifically for the plastic film and sheeting industry has been announced by the Naugatuck Chemical Division of the U. S. Rubber Co. The straight polyvinyl chloride resin, known as "Marvinol VR-21," has the processing characteristics of the vinyl copolymers and retains the superior end product properties of straight polyvinyl chloride, the company states. The resin can be used to manufacture film and sheeting free of gel particles at processing temperatures 15 to 20 degrees lower than those used for other polyvinyl chloride resins. It has a particle size and density which make for a fast solution rate thus allowing either lower temperatures or shorter processing times.

JOINT COMMITTEE ON AUTOMOTIVE RUBBER REPORTS CONSIDERABLE PROGRESS

Considerable progress was reported at the 61st meeting of the SAE-ASTM Technical Committee on Automotive Rubber. Held on September 17 in Detroit, Mich., the meeting was attended by 35 representatives from 25 member companies. Dr. H. A. Winkelmann (Dryden Rubber) is chairman of the committee, and J. T. O'Reilly (Ford Motor) is secretary.

It was reported that revisions on two standards had been approved by letter ballot, i.e., Recommended Revisions to the SAE Standard for V-Belts and Pulleys (as revised May 27, 1952) and Proposed Revisions to ASTM D-735-SAE R-10. In casting a negative ballot on the belt-and-pulley standard, W. J. McCortney (Chrysler) remarked that "if a definite position for lock-up is necessary (as covered in the last paragraph), it is our opinion that it should be in the position that would cause earliest failure of the belt." This negative ballot was subsequently withdrawn, since it was agreed that there was some doubt as to which position is the most severe.

With regard to the Proposed Revisions on the ASTM D-735-SAE R-10 standard, J. T. O'Reilly (Ford Motor), who cast an affirmative ballot, stated that he was urged to strongly recommend to the committee that changes such as the tensile and elongation values that have been made in SAE R-10 be kept to a minimum, as it seriously handicaps users in keeping consistent application charts from which blueprint rubber specifications are derived. No negative votes were cast on these proposed revisions.

Report of Various Sections

Section I (Vibration Insulators) reported that editorial revisions of the motor mount test had been considered. It was proposed that the word "automotive" be added to the title and the word "compounds" substituted for "composition" throughout the classifications. The committee approved these editorial revisions. The section also reported that Section III-A of the test had been rewritten in order to further clarify the purpose of the recommended practice.

The section further reported that it had reviewed specifications recently suggested by Section XII (Laboratory Procedures) and had decided that the proposed round robin test program be delayed until laboratory samples are obtained and engine mounts are tested as to dynamic properties and in life tests. The section felt that the machines have not yet been sufficiently correlated with road tests. It was also stated that a report on road service testing is now in the process of preparation for presentation at an early scheduled meeting.

C. P. Mullen (Gates Rubber), reporting for Section III (Hose), stated that this section had held a prior meeting on September 11. The purpose of this meeting was to discuss a draft of military specifications for automotive and fuel oil hose which is to supersede the U. S. Army Specification 20-134, and to discuss the draft of the military specification for automotive wire braided hose which is to supersede U. S. Army Specification 20-143.

The fuel and hose specifications were then discussed in detail and a number of changes made throughout. Mr. Mullen said that Army Ordnance wants to write specifications separate from the Air Force and then coordinate with Air Force specifications at a later date.

J. J. Allen (Firestone), chairman of Section IV (Classification and Specification of Automotive Rubber Compounds), reported that at a prior meeting the section had discussed three items which require action by the full committee. These were: (1) Proposed addition of a moisture absorption requirement to ASTM 1056-51-T which will be a measure of the degree of closed cell in sponge; (2) Revision of ASTM D-735-52-T, which corresponds to SAE R-10, to spell out in the scope that wire and cable are specifically excluded; (3) Specification on nonrigid plastics. The secretary was instructed to circularize letter ballots on these three items.

Scope of V-Belt Committee

E. G. Kimmich (Goodyear), chairman of Section VI (V-Belts), reported that the section had run into a little difficulty with regard to the scope of the section originally approved by the full committee. The present scope restricts the section to vehicles but some organizations, particularly the Munitions Board, are interested in seeing it expanded to cover stationary engines as well. It was agreed, however, that no further revision of the scope was required at present, and it was emphasized that since most of the engines used in stationary applications are adaptations of vehicle engines, the engineering requirements would certainly be quite similar.

Although S. R. Doner (Manhattan Rubber), chairman of Section IX (Hydraulic Brake Cups), reported that the section had nothing to report, Mr. O'Reilly said that Ford Motor is interested in having the heavy duty cup specification extended to include master cylinder cups as well as wheel cylinders. The section will take this request under advisement for future action.

Gasket Committee Reports

J. M. Clark (Packard Motors), chairman of Section X (Gaskets), reported that the section had held a meeting just prior to the committee meeting and that as a result of new beater-mixed fiber compositions being offered for inclusion in D-1170-51-T a study group has been appointed to suggest more descriptive definitions of the various fiber and filler classifications, without altering the numerical classifications. He also stated the section was considering correlation of the Mullen and tensile tests and that a round robin test has been established for this particular purpose.

Mr. Clark also reported that stress relaxation on gaskets has been reviewed by the section and a study group will report on applicable test methods at an early meeting. He also said that values appearing in the D-1170 tables have been changed to more descriptive ranges, and these will be letter balloted by the section after which they will be submitted to the full committee for final approval. The section has also appointed a round robin test group to evaluate new gasketing submitted by a vendor for approval into its proper classification.

Mr. O'Reilly, in his capacity of chairman of Section XI (Oil Seals), reported that at an earlier meeting the section had reviewed a proposed revision for testing of oil seals. This revision is to be circulated by the section by letter ballot and, if approved, it will be presented to the full committee with the recommendation that it be included in the SAE Handbook as a recommended practice.

Several other sections submitted brief reports, and numerous changes in section memberships were announced. The full committee was scheduled to hold its 62nd meeting in Detroit on December 12.

Bearfoot Sole Completes Merger

The directors of the Bearfoot Sole Co., Wadsworth, Ohio, have announced the completion of a merger between the Bearfoot Sole Co., a Massachusetts corporation, and the Bearfoot Sole Co., an Ohio corporation. The Ohio corporation assumed all assets and liabilities of the Massachusetts corporation as of November 1, 1952, and the Ohio corporation is the only survivor. Officers of the new company are: Edwin Calvin, chairman of the board; Irl B. Calvin, president; Ernest Calvin, vice-president and treasurer; Timothy D. Calvin, executive vice-president; G. C. Worthington, vice-president and secretary; Homer Beaver, vice-president in charge of production; L. E. Hardwick, vice-president in charge of sales; J. M. Calvin, vice-president in charge of export and New England Sales; E. E. Calvin, vice-president in charge of personnel; Edward Gulbis, vice-president in charge of research and development; B. D. White, Sr., vice-president and chief engineer; and Robert C. Brouse, assistant secretary.

Sharples Sales Staff Changes

Sharples Chemicals Inc. announces two changes in its midwestern sales staff. R. H. Samis who has been respresenting the company in the Detroit area will now service all of Michigan with the exception of the Upper Peninsula. Mr. Samis has been with Sharples for 26 years. His experience has included sales work, plant production and administration. He will bring to Michigan customers and prospects a wide knowledge of Sharples products. Frank K. Hoover, who left the midwestern sales force two years ago to serve as assistant to the executive vice-president, will represent Sharples in Minnesota, Wisconsin, the Upper Peninsula of Michigan and the northern halves of Indiana and Illinois. Mr. Hoover has also served on the chemical engineering staff at the Wyandotte plant.

GOODYEAR PRESIDENT FORESEES RUBBER INDUSTRY GAINS IN '53

E. J. Thomas, president of the Goodyear Tire & Rubber Co., foresees a good year for the rubber industry in 1953, with rubber consumption breaking all records and tire production the best in five years. Before an Akron audience, Mr. Thomas said tire production will probably pass the 100,000,000 mark in the passenger car, truck and bus, airplane, motorcycle and tractor categories. This will make 1953 the second best year the industry ever enjoyed, exceeded only in 1947 when there was a tremendous wartime void to fill.

He estimated American rubber consumption for the year at around 1,288,000 long tons, about twice as much as the country used in the pre-war year of 1940. About 58 per cent of the record 1953 consumption will be synthetic, and 42 per cent tree rubber.

Increased use of rubber, he said, is brought about by two factors. There are more vehicles on the road and the owners of these vehicles are driving more miles and hence wearing out more rubber per vehicle. Newer rubber products are expanding their markets tremendously. Foam rubber is booming; films and plastics are on the rise; and rubber roads give promise of rapidly expanding commercial use.

Synthetic as Bulwark

Another encouraging part of the picture, Mr. Thomas said, is that the synthetic rubber industry is providing a great bulwark of protection against the historic instability of the natural rubber market—a condition which has seen prices fluctuating between the extremes of three cents a pound to $1.25 a pound.

"Such wild gyrations of the natural rubber market have been the nightmare of the industry but now seem to have been brought into check. So long as we keep our synthetic facilities in adequate and competitive position the natural rubber market is not likely to run away as it has so often in the past."

Looking beyond 1953, the Goodyear president sees some danger signals. One is a threatened rubber shortage unless we expand our American synthetic rubber capacity. A second is the rapidly developing crisis of our inadequate highway system. America today is consuming 18 pounds of rubber per capita, compared to one pound in 1900, and the rest of the world is consuming a little over a pound per capita. By 1960, he predicted, world demand for new rubber will be far beyond our present supply. "The course," he declared, "really narrows down to additional synthetic rubber producing capacity. This appears to be our only possible choice."

He urged that the national highway problem be attacked at the local level, by cities, counties and states through local organizations of PAR (Project-Adequate Roads). "The Goodyear organization is vigorously and enthusiastically supporting the PAR movement to get the ball rolling at the local level because that is where the job must be done."

Goodyear's entry into the atomic energy field, said Mr. Thomas, was prompted by two primary considerations. The company believes that America must lead in atomic developments, for national defense and security. Second, the atomic age will bring far-reaching changes in our economic productivity and social progress and Goodyear wants to be in step with this great movement.

Mr. Thomas sees the recent election results as establishing a change of national course from far left to center, bringing a gradual return of incentive for the individual citizen and creating a healthier atmosphere for business. "Our nation and our people are going forward to new opportunity and accomplishment. It is a prospect which should arouse in us a spirit of real Thanksgiving."

Sees Rubber Shortage by 1960

In another recent address in Akron, Mr. Thomas opined that in seven or eight years the world won't have enough rubber to meet even normal demands. The answer, he said, lies in synthetic rubber. Right now is the time to start doing something about it. Mr. Thomas traced the rise in the use of rubber in America from about one pound per person in 1900 to an average of 18 pounds per person today. The same thing has been happening worldwide, but on a slightly reduced scale. At the same time, he cited the increased demand both here and abroad for new rubber items of all types, such items as foam rubber, for example.

We are estimating, he reported, that on the basis of current trends and past experience, that 1960 will bring the world and domestic demand for new rubber to a total far beyond the present supply. It is estimated that the per capita consumption for the balance of the world outside the United States will be 20% higher in 1960 than the current figure of 1 4/10ths pounds per capita.

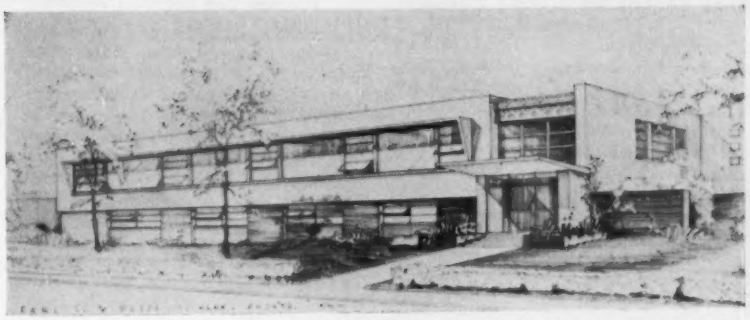
Total world demand, United States included, is going up to a figure considerably above the total yield of existing plantations and synthetic plants. And this is going to take place between now and 1960, he said. Further, Mr. Thomas observed, all this is figured on the basis of a world at peace. Should war come an entirely different set of circumstances would govern.

Planting more rubber trees is no answer, he said. A tree set in the ground today produces nothing for at least seven years. Besides, a rubber tree can be expected to produce for only 25 to 30 years. There must be constant replacement. But now, and for some time past, political conditions in most of the rubber growing areas of the world have been much too unstable to encourage capital expansion.

Mr. Thomas called additional synthetic rubber production our only possible choice if we are to continue to have an expanding economy. For rubber, he pointed out, is the foundation stone of mobility—and mobility is the foundation stone of economic progress. The Goodyear official stated that synthetic has come of age. Its quality has progressed to a point where it commands public acceptance equal to that of natural in important segments of the tire industry.

Synthetic producing plants also have served as a great bulwark of protection against the historic instability of the natural rubber market. That market, he said, subject always to "wild gyrations," has sold rubber for as little as 3c a pound, and as much as $1.25 a pound. So long as we keep our synthetic facilities in adequate competitive position, he stated, the natural rubber market is not likely to run away as it has so often in the past.

ARCHITECT'S CONCEPTION OF NEW CINCINNATI RUBBER MFG. CO. OFFICE



Shown above is an architect's conception of the new office building to be constructed for the Cincinnati Rubber Manufacturing Co. in Cincinnati, Ohio. The red and grey brick building will measure 66 by 80 feet, and will be two stories high. It will be completely air conditioned and will have acoustic tile and insulation ceilings.

Technical Service Expansion

Snyder Chemical Corp., Bethel, Conn., has announced the expansion of its technical service to include a special department for better additional research with particular emphasis on phenolic resin-elastomer co-precipitations. Further investigations are scheduled for the applications involving the use of beater addition resins with nitrile, neoprene, GR-S, polyvinyl acetate and natural latices as well as acrylics. This program has been developed to meet the requirements of the specialty paper-making field, the company stated.

Dewey & Almy Chemical Co. has issued a new technical report on the "Evaluation of Darex 43G in Gum Formula and Comparison with Competitive Resins."

WASHINGTON RUBBER GROUP HEARS THREE PAPERS ON NITRILE RUBBERS

The Washington Rubber Group held its November 19th meeting in the auditorium of the Potomac Electric Power Co. Building in Washington, D. C., with approximately 100 members and guests in attendance. The group heard three papers on nitrile rubbers from three different representatives of B. F. Goodrich. Dr. Waldo L. Semon, director of pioneering research, spoke on a "History of Nitrile Rubbers." N. G. Duke, development supervisor of Hycar rubber and latices for Goodrich Chemical, spoke on "Oil Resistance of Nitrile Rubbers," while R. C. Bascom, technical service manager of Hycar rubber chemicals for Goodrich Chemical, spoke on "Nitrile Rubber and Latex Applications."

Dr. Semon outlined the history of the nitrile rubbers beginning back in 1929 with the work done by Ziegler of I. G. Farben at Leverkusen, Germany. Dr. Semon defined nitrile rubber as a copolymer of unsaturated nitrile, such as acrylonitrile, with butadiene, isoprene, or certain other modified monomers. The name Buna was given to the polymer produced at I. G. Farben since it contained butadiene and was polymerized with natrium (sodium) used in Germany at this time.

Copolymers of butadiene with these monomers are unusual in that the resulting product contains the good properties of the parent compounds, Dr. Semon pointed out. He traced the Goodrich work on the analysis of Buna N which enabled the company to produce Hycar and to start the nucleus of the nitrile rubber industry in the United States.

Continuing the discussion, Mr. Duke outlined the properties of the nitrile rubbers. His portion of the presentation was illustrated with slides. Some of the properties discussed included oil resistance; effect of pigmentation; effect of different softeners in the swell of the vulcanizate; nitrile rubber in blends; effect of ASTM oils on the swell of the polymer; and effect of the aniline ASTM oils on swelling.

Mr. Bascom concluded the talk with a display of some products made from Hycar rubber. He explained the role of nitrile rubber during World War II and showed fuel seals for aircraft, oil rings, hose, etc. He also showed the manner in which it is used in containers for petroleum-based oils and in the manufacture of briefcases.

Abstract Deadlines Announced

S. G. Byam (DuPont), chairman of the Division of Rubber Chemistry of the American Chemical Society, has announced that deadline dates for abstracts of papers to be presented at divisional meetings in 1953 have been set. January 2 is the deadline for abstracts of papers for the meeting scheduled on March 18 to 20 in Los Angeles, Calif. Deadline for abstracts of papers to be presented at the May 27 to 29 meeting at Boston, Mass., has been set at April 16. Abstracts of papers to be presented at the Chicago, Ill., meeting scheduled for September 9 to 11, should be submitted by August 5.

Woman Tire Builder's Record

Mrs. Stanley Bargiel, tire builder at the Chicopee Falls, Mass., plant of the U. S. Rubber Co., has figured her personal output of automobile tires during the last 34 years at 751,557. Although the only woman tire builder in the factory, Mrs. Bargiel is rated among the most skilful. She specializes in smaller sizes and her output has often set records in times of stress such as World War II. A native of Poland, Mrs. Bargiel married Stanley Bargiel, also a tire builder at the plant, in 1919. Mr. Bargiel, also a native of Poland, and his wife acquired U. S. citizenship in 1922. As Mr. and Mrs. Bargiel reach retirement age, they have set a joint production goal of 1,500,000 tires.

Goodyear Atomic Personnel

Organization of key personnel for the operation of the government's new atomic energy plant, now under construction near Portsmouth, Ohio, is well under way at the offices of the Goodyear Atomic Corp. A. J. Gracia, manager of the new organization which is a subsidiary of the Goodyear Tire & Rubber Co., and which will operate the new facilities, announced that Dr. Charles R. Milone, formerly a section head in the research laboratories of Goodyear Tire, has joined Goodyear Atomic as superintendent of the Atomic Research Laboratory. Dr. Richard B. Stambough, also previously associated with Goodyear Tire research, has been named superintendent of the Works Laboratory. Other personnel transferred from key posts at Goodyear Tire to duties in the Staff Engineering and Maintenance Division of Goodyear Atomic, include: Hugh F. Porter, Jr., head of the Electrical and Instrument Division; Ralph J. Nance, superintendent of Shops Maintenance; Robert M. Rutherford, head of Utilities and Utilities Maintenance; Thomas W. Leary, superintendent of Process Maintenance; Arthur J. Brust, superintendent of Planning and Scheduling; and Nathan H. Hurt, Jr., superintendent of Staff Engineering.

In other appointments, Oka Carlson was named superintendent of Cascade operations, while Jay B. Mitchelson was appointed superintendent of chemical operations. John R. Arndt has been named superintendent of product plant operations and Arthur H. Wernecke has been appointed superintendent of the uranium control department.

Foxboro Expands Facilities

New factory facilities for the assembly of control valves were recently acquired at Dallas, Texas, by the Foxboro Co., Foxboro, Mass. Convenient to the Dallas office of the company, the new facilities will practically double the area devoted to valve assembly and warehousing, and will facilitate rapid delivery and service to industries throughout the South and Southwest which have been served from the Dallas branch for over 20 years.

RHODE ISLAND ELECTS OFFICERS AND HEARS ADDRESS BY LITZLER

The Fall Meeting of the Rhode Island Rubber Club was held at the Metacomet Golf Club, East Providence, R. I., on November 20. Approximately 150 members and their guests attended the meeting which featured an election of officers for 1953 and a paper by C. A. Litzler, president of Industrial Ovens, Inc., Cleveland, Ohio. Mr. Litzler spoke on "The Surface Coating and Impregnation of Fabrics," the same paper which appeared in full in recent issues of RUBBER AGE.

Roy G. Volkman (U. S. Rubber) was elected chairman of the group, succeeding C. Leigh Kingsford (U. S. Rubber). Francis W. Burger (Kleistone Rubber) was elected vice-chairman, while Urbain J. Malo (Crescent) was elected secretary-treasurer.

Elected to the board of directors for three years were Walter S. Blecharczyk (Davol Rubber) and Harry Ebert (Firestone). Elected to the board for two years were W. K. Priestly (U. S. Rubber) and H. Webster Day (DuPont). Gilbert Enser (Collyer Insulated Wire) and Ray W. Szulik (Acushnet Process) were elected to the board for a one-year term.

Quebec Group Holds Meeting

The November 20th meeting of the Quebec Rubber and Plastics Group held at the Queen's Hotel in Montreal, Que., Canada, attracted about 80 members and guests. Douglas Walkington of Canadian Industries, Ltd., was the principal speaker of the meeting and spoke on "New Yarns for Old." Mr. Chase described the progress which has been made in the textile industry throughout the years and particularly of the association between chemistry and textiles. He described the latest chemical fibers both as to their advantages and shortcomings and spoke of the new horizons yet to be conquered.

SPE to Meet in January

A number of interesting papers have been scheduled for the Ninth Annual Conference of the Society of Plastic Engineers, Inc., which will be held from January 21 through 23, 1953 at the Hotel Statler, Boston, Mass. At a session on Friday morning, January 23, two papers of particular interest will be presented. M. S. Greenhalgh (G-E) will speak on "Vinyl Compounding", and A. P. Landall (G-E) will speak on "Engineering Design for Rubber Phenolics". Moderator for the session will be Frank A. Rideout (Bakelite). A report on the papers and the meeting will appear in the February, 1953, issue of RUBBER AGE.

Ferro Chemical Names Ramco

Ferro Chemical Corp., Bedford, Ohio, has announced the appointment of Ramco, 95 Market St., Oakland, Calif., as sales agents in the Northern California territory. Ramco will act as agents for the sale of Ferro Chemical metallic soaps, driers, fungicides and stabilizers to the rubber, plastics, paint and other industries.

ELASTOMER GROUP HEARS D'IANNI ON SURVEY OF SPECIALTY RUBBERS

The November 18th meeting of the Elastomer and Plastics Group of the Northeastern Section, American Chemical Society, held at the Massachusetts Institute of Technology in Cambridge, Mass., heard an address by Dr. J. D. D'Ianni, assistant to the vice-president in charge of research and development of the Goodyear Tire & Rubber Co. Dr. D'Ianni delivered a paper on "A Survey of Modern Specialty Rubbers."

The following members were named as officers of the group for the 1952-53 season: *Chairman*, L. H. Perry (Union Bay State Chemical); *Vice-Chairman*, J. M. Hussey (Goodyear); *Secretary-Treasurer*, F. J. Roderick (Simplex Wire). W. J. Perkins (Avon Sole) was named custodian. E. R. Kaswell (Fabric Research) was named to the Executive Committee for a three-year term, while J. H. Faull, Jr. and J. B. Gregory were named to the committee with remaining tenure of two years and one year respectively.

In his address, Dr. D'Ianni discussed the history and early development of Butyl rubber. He noted that difficulty with cold buckling of inner tubes was eliminated by production of a polymer of higher molecular weight, plasticized with paraffin hydrocarbons. Mechanism of the polymerization of isobutylene was discussed. Data on the structure of polyisobutylene and Vistanex from x-ray diffraction and ozonolysis studies were summarized. Problems involved in the vulcanization of butyl and the effect of various types of accelerators were discussed. The excellent properties of butyl, such as low permeability to gases and high tensile strength were emphasized.

Sketches Neoprene Developmnt

The early development of neoprene was sketched, and the types now commercially available were described. Also referred to were the micro- and macro-structural features of neoprene as we know them today from polymerization studies with radio-active sulfur. X-ray diffraction studies, and determination of molecular weight from osmotic and viscosity studies were also covered. The general properties of neoprene vulcanizates were described such as high gum tensile strength, excellent sunlight resistance, and resistance to oils and other chemicals.

Butadiene-acrylonitrile rubbers have now firmly established themselves in applications where good oil resistance and moderate low temperature flexibility are desired. It was pointed out, however, that little can be done by variations in polymerization conditions to improve the balance between these properties. "Cold" nitrile rubbers are of interest since they exhibit improved tensile strength and increased solubility as compared to the polymers prepared at higher temperatures. Recent polymerization studies of butadiene-acrylonitrile polymers prepared at 5° C. with varying charges of monomer ratios were described.

The Thiokol class of polymers were discussed with particular emphasis on the newer varieties containing a branched structure with terminal thiol groups which, upon vulcanization by oxidation reagent, result in cross-linked structures. Oil-resistance of this class is primarily dependent upon the sulfur content of the polymer. Certain Thiokols exhibit an excellent combination of oil resistance of low temperature flexibility, Dr. D'Ianni stated.

The wide useful temperature range of silicone rubbers was described, and attributed to the higher strength of the silicone-oxygen linkage as compared to the carbon-carbon linkage in the usual type of rubber polymer. Recent improvements in the vulcanization and compounding of silicones with hydrophobic silica to yield tensile strength at 1900 psi, and ultimate elongation of over 600%, were described by the author.

The acrylate rubbers now commercially available were briefly referred to and a proposed mechanism for cross-linking by Claisen type condensation for cross-linking was described. Outstanding properties of acrylic rubbers are good flexibility resistance, resistance to hot oils and air, and unlimited resistance to oxygen and ozone.

The detailed steps in the preparation of diisocyanate rubbers, such as Vulcollan and Vulcaprene, were traced. Vulcollan rubbers possess extremely high gum tensile strength and abrasion resistance, but are deficient in resistance to acids and alkalies, and possess only fair low temperature flexibility. Their properties indicate applications in shoe heels, and many mechanical goods where extreme toughness and high abrasion resistance are required.

IMPORTS OF RUBBER MANUFACTURES—FIRST NINE MONTHS OF 1952

The following table shows the principal classes of U. S. imports of rubber manufactures as officially reported by the Bureau of the Census for the first nine months of 1952, in comparison with the first nine months of 1950 and 1951.

		9 Mos. 1950	9 Mos. 1951	9 Mos. 1952
Auto, motorcycle, truck and bus	No.	18,463	43,473	81,396
casings and solids	$	277,293	1,448,949	3,146,824
Bicycle Casings and single	No.	13,920	45,239	33,136
tube tires	$	13,465	49,221	59,373
Other tires	No.	8,652	1,389	1,416
	$	5,144	48,529	42,823
Inner tubes for	No.	1,477	39,832	5,479
autos, trucks and buses	$	2,393	121,346	11,002
Rubber boots and shoes	Prs.	135,837	173,424	396,113
	$	300,207	240,517	532,556
Canvas rubber-	Prs.	45,393	71,836	73,260
soled shoes	$	27,572	56,011	54,674
Golf, tennis, and other rubber	No.	3,652,290	2,887,284	891,679
balls—athletic or sporting	$	359,965	488,032	185,043
Other rubber toys	$	395,680	245,338	284,069
Hard rubber goods	$	182,789	702,390	299,471
Molded cotton and rubber	Lbs.	8,826	31,785	41,290
packing, chief value cotton	$	12,515	47,849	83,740
Machinery belts and	Lbs.	31,559	79,188	145,461
belting over 40c per lb.	$	35,647	105,036	147,854
Other mechanical goods	$	70,555	336,116	135,888
Rubber gloves	Prs.	12,126	428,912	295,289
	$	1,358	127,384	76,869
Other druggists soft rubber sundries	$	31,963	79,483	80,366
All other	$	729,743	1,498,070	998,334
Total Rubber Products	$	2,446,289	5,594,271	6,138,886

Winchester Rubber Files Petition

Winchester Rubber & Plastics Co., Inc., manufacturers of shoe soling compounds and other rubber specialties at Lodi, N. J., recently filed a petition in bankruptcy under Chapter XI of the Bankruptcy Act in the U. S. District Court at Newark, N. J. The filed schedule shows liabilities of $248,082 and assets of $83,745. According to the petition, the management of the company proposes to pay unsecured creditors a total of 15%, of which 5% would be paid on confirmation of the plan, 5% in 60 days after confirmation, and 5% in 120 days after confirmation. The company was organized in 1945, with George W. Winchester and Elliott E. Simpson as principal stockholders. Mr. Winchester, who served for many years as a factory department manager for the Norwalk Tire & Rubber Co., and before that was with the U. S. Rubber Co., severed his connection with the company several months ago, and it is believed that his stock interest was acquired by Mr. Simpson. In past years, Mr. Simpson was actively associated with the crude rubber field. Among concerns with which he was identified in this field were Simpson & Simpson, Inc., Simpson Rubber Products Corp., and Rubber Brokers, Inc.

TRAINER SEES RUBBER INDUSTRY WELL PREPARED FOR 5-YEAR WAR

In a recent address before the Washington Post of the American Ordnance Association in Washington, D. C., J. E. Trainer, vice-president in charge of production of the Firestone Tire & Rubber Co., stated that our country's rubber industry is well prepared as an ordnance supplier. He said that we have a large natural rubber stockpile, sufficient to sustain a five-year war effort.

Speaking on the subject "The Rubber Industry as an Ordnance Supplier", Mr. Trainer stated that we have a synthetic rubber producing capacity of more than one million tons a year, compared with a capacity of 12,000 tons a year in 1941. The know-how to make good products out of synthetic rubber compares with our having to "start from scratch" in 1941, he pointed out. He also observed that we have increased our capacity by 75% for converting rubber supplies into tires and tubes.

The speaker noted that the importance of rubber to our national security is emphasized by the fact that it is the only major raw material that has been made the subject of separate legislation. The Rubber Act of 1948, he said, subsequently extended, gave government a large measure of control over rubber and the rubber industry.

Rubber Industry's First Job

In order of importance, he emphasized, the first job of the rubber industry as an ordnance supplier is to provide tires and tubes. Tires are essential for ordnance vehicles; for aircraft; and for trucks, buses and automobiles to transport war materials, and war plant and military personnel. He explained, however, that tires are not the whole of the rubber picture.

Today, all tanks for combat areas roll on rubber tracks and bogey wheels. Engines are mounted on rubber. Combat aircraft are equipped with bullet-sealing fuel tanks made of rubber. Other rubber equipment used by the Armed Forces includes inflatable boats and life preservers; bridge pontoons; protective clothing; hose for transmission of fuel, oxygen and air, and for fighting fires; footwear; medical supplies, gas masks; high altitude oxygen masks; fan belts; storage battery cases; weather balloons; wire insulation; crash pads for tanks; and gaskets for applications ranging from engines to food containers.

In a field closely related to rubber in many respects, the industry has provided for the Armed Forces articles of molded plastics, such as gun stocks, helmet liners, and prescription-type shatter-proof lenses for eyeglasses.

Mr. Trainer said that, based upon mobilization plans as we know them today, it is estimated that 43% of the rubber industry's output will be required for direct military items in the event of a future war. A further 27% would be required for indirect military items, such as truck tires for transportation of military supplies within the United States. The remaining 30% of the industry's capacity would be available for civilian production. And this civilian production, to a large degree, is also essential in the prosecution of a war.

The speaker noted that at the time of Pearl Harbor the United States had a stockpile of natural rubber of 640,000 tons, or 12 months' supply at the 1941 rate of consumption. We were faced with having to stretch supplies until synthetic plants could be brought into volume operation on a new product, and until the industry could learn to use the new product.

Mr. Trainer stated that during World War II, Firestone plantations in Liberia were one of our country's sources of natural rubber latex, required for medical rubber goods and for insulation of special types of wire used in combat. These plantations also contributed substantial quantities of dry rubber, he said. Without them, our World War II national stockpile would have been exhausted by the end of the war. These plantations now have mature acreage sufficient to increase their output by 100% over peak production in World War II, he concluded.

Opposes Trade Terminology

Dow Chemical Co., Midland, Mich., is now waging a campaign to bar "rubber" from any designation of latex paints. Most popular dictionaries—and most trade vernacular—define latex as a form of natural rubber. That, says Dow, is incorrect because from a chemical standpoint latex is an over-all term which embraces both natural and synthetic rubbers. Recently company officials met with major dictionary publishers and worked out a definition of latex which differentiates between synthetic latex for paint and rubber latex. A Dow official pointed out that merely because there is a remote chemical relationship between paint latex and rubber latex, promotion minded latex manufacturers are capitalizing on the fact that "rubber" is associated with quality in the public mind. Latex is a product which can stand on its own, he said.

Sees 95,000,000 Tires in 1953

L. A. McQueen, vice-president in charge of sales of the General Tire & Rubber Co., speaking at his company's recent annual sales convention in Akron, predicted the production of 95,000,000 units in the tire and tube industry in 1953. With more economy in government, business, and personal habits, he said, inflation will soon end, and the dollar will have more value. General Tire, he stated, expects to do more business in 1953, not less. The sales record of 1952 will be higher than 1951 and the outlook was never brighter than it is now.

A new catalog of products for use in the chemical processing industries has been released by the Mechanical Goods Division of U. S. Rubber.

PCFA NINE-MONTH REPORT SHOWS INCREASED VOLUME OF SHIPMENTS

A 7 percent increase for plastic-coated fabrics and a 14 percent increase for all-plastic sheeting 10 mils and over in the volume of shipments for the first 9 months of 1952 over the comparable period of 1951 was indicated recently in figures released by the Plastic Coatings and Film Association, New York, N. Y.

As of the end of September, the PCFA report showed shipments of 32,390,016 linear yards of plastic-coated materials for 1952 as against 30,092,860 yards last year. The nine-month total for all-plastic sheeting 10 mils and over for this year was 42,724,269 square yards as compared to 37,178,519 yards in 1951. These figures cover shipments of association members and cooperating companies who represent a substantial majority of the nation's output of plastic-coated fabrics, all-plastic sheeting and pyroxylin-coated materials.

As in the first and second quarters of 1952, the association report again showed shipments of pyroxylin-coated materials to be running behind 1951. For the nine-month period a total of 22,028,793 linear yards of pyroxylin-coated materials were shipped compared to 27,840,828 yards for the same period in 1951.

Johnson Makes Statement

In releasing the PCFA third-quarter figures, Paul F. Johnson, secretary of the association, said that September shipments were the second highest of the year for both plastic-coated fabrics and all-plastic sheeting. The September shipments of 4,041,149 linear yards of plastic-coated materials were barely topped in June when 4,073,439 yards were shipped. The September shipments of all-plastic sheeting which totaled 5,692,126 square yards, were exceeded only by the March high of 6,017,870 yards.

Of the 32,390,016 linear yards of plastic-coated fabrics shipped during the first nine months of 1952, 27,781,342 yards were heavy weight fabrics (over 10 ounces per square yard). In the comparable period of 1951, 24,823,175 yards of heavy weight coated fabric were shipped. Light weight coated fabrics (10 ounces and under) accounted for 3,080,468 yards in the first nine months of 1952 as against 3,648,374 yards in 1951. A total of 1,528,206 linear yards of custom coated materials were shipped during the first nine months of 1952 compared to 1,621,311 yards in 1951.

Shipments of all-plastic sheeting 10 mils and over for the first nine-months of this year as reported to the PCFA were 42,724,269 square yards as compared to 37,178,519 yards in 1951. Shipments of medium weight sheeting (10 to 15 mils inclusive) for the same nine-month period came to 26,243,752 yards as against 24,117,412 yards in the comparable period in 1951.

Medium-heavy weight sheeting (from 16 to 19 mils inclusive) accounted for 2,281,157 square yards in the first nine months of 1952 as compared to 964,702 yards in the same period last year. Sheeting 20 mils and over accounted for 14,199,360 yards in the period through September as compared to 12,096,405 yards last year, the association said.

CONNECTICUT GROUP FALL MEETING FEATURES TALKS ON BUTYL RUBBER

Approximately 150 members and guests of the Connecticut Rubber Group attended the Fall Meeting held on November 13 at Rapp's Conti Room in Shelton, Conn. Principal speakers of the meeting were Robert M. Thomas and Donald J. Buckeley, both of the Standard Oil Development Co., who spoke on "Recent Compounding Developments and Applications in Butyl Rubber." Their talks were illustrated by slides.

Mr. Thomas traced the development of Butyl Rubber from Otto down to the present time and discussed some of the methods and problems involved in the making of Butyl. Slides of the Butyl plant equipment at Baton Rouge were shown giving the audience an idea of the amazing complexity of towers and piping used in its manufacture.

Mr. Buckeley then reviewed the older and newer methods of curing techniques and traced the methods involved in eliminating the cold buckling failure of Butyl inner tubes in upper U. S. and Canada. The newer techniques involving higher state of cure and the addition of ester type plasticizers have eliminated this difficulty. The effects of Tellurac, calcium peroxide, lead peroxide and sulfur in heat resistant compounds were pointed out in typical air bag compounds. The use of high Mooney oil-enriched Butyl polymers were noted as being an attraction for the cost-minded compounder.

In closing, both speakers stressed the need for compounders to resurvey the use of Butyl for some of the newer applications involving weather, heat, and ozone resistance.

In a short business meeting, it was announced that the following members had been nominated for officers of the group for the 1953 season: *Chairman*, F. J. Rooney (G-E); *Vice-Chairman*, Russell Paquette (Duro Gloss Rubber) and G. A. Di Norscia (Sponge Rubber Products); *Secretary*, Tom Zimmerman (R. T. Vanderbilt) and Jim Boyle (Armstrong Rubber); *Treasurer*, Ward Fisher (Armstrong Rubber) and George D'Olier (Raybestos-Manhattan).

A. Simons (H. O. Canfield), A. Schorr (R. T. Vanderbilt), R. P. Painter (Marbon) and A. Panagrossi (Connecticut Hard Rubber) were nominated as directors of the group.

Akron Plans Winter Meeting

The Winter Meeting of the Akron Rubber Group will be held on January 30, 1953, at the Mayflower Hotel in Akron, Ohio. The meeting will feature a panel discussion on "GR-S vs. Crude Rubber—Economics, Compounding, Utility." Dr. Henry F. Palmer (Kentucky Synthetic) will act as moderator for the discussion. Panel members will include: Harold J. Niemeyer (Firestone); Al Hosier (Faultless Rubber); Boyd Cook (Wooster Rubber); Merle Sanger (General Tire); John Brothers (Ohio Rubber); T. A. Riehl (Goodyear Tire). Jim Schlemmer of the *Akron Beacon Journal* will also address the meeting on "The Sports Outlook."

Coming Events

Jan. 15, 1953. Quebec Rubber & Plastics Group, Queen's Hotel, Montreal, Que., Canada.

Jan. 23, 1953. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Feb. 13, 1953. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

Feb. 23, 1953. Quebec Rubber & Plastics Group, Victoria Hall, Westmount, Que., Canada.

Mar. 18-20, 1953. Rubber Division, A.C.S., Hotel Statler, Los Angeles, Calif. (In conjunction with 122nd meeting of A.C.S.).

Mar. 19, 1953. Quebec Rubber & Plastics Group, Queen's Hotel, Montreal, Que., Canada.

Apr. 16, 1953. Quebec Rubber & Plastics Group in Joint Meeting with Society of Plastics Engineers and Society of the Plastics Industry, Queen's Hotel, Montreal, Que., Canada.

May 27-29, 1953. Rubber Division, A.C.S., Spring Meeting, Hotel Statler, Boston, Mass.

Sept. 9-11, 1953. Rubber Division, A.C.S., Fall Meeting, Hotel Sherman, Chicago, Ill.

Apr. 14-16, 1954. Rubber Division, A.C.S., Spring Meeting, Hotel Brown, Louisville, Ky.

Sept. 15-17, 1954. Rubber Division, A.C.S., Fall Meeting, Hotel Commodore, New York, N. Y.

Adopts New Futures Contract

The members of the Commodity Exchange, Inc., New York, N. Y., voted on November 28 to adopt another rubber futures contract entitled No. 3 R.S.S. Contract. Trading in this new contract began on December 1, with first delivery in March, 1953. The contract (basis grade) for the No. 3 R.S.S. Contract is No. 3 Fair Average Quality Ribbed Smoked Sheets (Exchange Type). The following grades are also tenderable against the contract at the premiums indicated: No. 1 Standard Quality Ribbed Smoked Sheets (Exchange Type) at ½c per pound premium; No. 2 Good Fair Average Quality Ribbed Smoked Sheets (Exchange Type) at ¼c per pound premium. The present No. 1 R.S.S. Rubber Contract will continue to be traded in concurrently with the new contract. Only No. 1 Standard Quality Ribbed Smoked Sheets is deliverable against the present contract.

Issue No. 12 of the Hycar Technical Newsletter released by Goodrich Chemical covers "The Resistance of Hycar American Rubber to Various Oils."

PHILADELPHIA GROUP HEARS SERIES OF TALKS ON BUTYL

Approximately 150 members and guests of the Philadelphia Rubber Group attended the November 14th meeting held at the Poor Richard Club in Philadelphia, Penna. After a cocktail hour and dinner, the members heard three talks on "Butyl—Its History, Manufacture, and Application." Principal speakers were Dr. W. J. Sparks, director of the Chemical Division, Standard Oil Development Co.; R. M. Thomas of the New Products Division of the Standard Oil Development Co.; and A. N. Iknayan, manager of tire development for the U. S. Rubber Co., Detroit, Mich.

Dr. Sparks spoke on the history of Butyl rubber and noted that the material was announced in 1940 as ready for trial use. Within the next few years, he said, it had become the prime polymer for inner tubes.

Mr. Thomas then spoke on the manufacture of Butyl and illustrated his talk by polymerizing isobutylene to illustrate the rapidity of the action. He described the manufacturing process for making the polymer and for recovering the unreacted gases. He further noted that one billion pounds of the polymer have been produced to date.

Mr. Iknayan, for his part, discussed the compounding and processing problems which had to be overcome with the adoption of Butyl for inner tubes. His discussion also included service problems that were overcome.

"Coldbar" Special Winter Uniform

The U. S. Army has announced plans to test new foam plastic garments in Korea this winter. Known as the "Coldbar" special-purpose winter uniform, the garments consist of jacket and trousers which are worn next to the skin without underwear. They are protected from external abrasion by a lightweight cotton jacket and overall. The plastic garments themselves weigh only five pounds. "Coldbar" was developed by the U. S. Rubber Co. from polyvinyl-chloride in a form similar to sponge rubber. The plastic, one-quarter of an inch thick, is cut to pattern from sheets. It contains microscopic air cells which provide insulation and keeps the wearer warm regardless of whether his skin is wet or dry. In addition to insulating the wearer against the elements, a "Coldbar" suit will also keep him afloat in deep water, even when wearing a pack. The U. S. Marine Corps is also interested in the new garments. Initial Army tests have been described as "very successful."

Named ACS President-Elect

Harry L. Fisher, special assistant on research and development to the director of the Office of Synthetic Rubber, Reconstruction Finance Corporation, has been chosen President-Elect of the American Chemical Society for the year 1954. Dr. Fisher, a nationally-known authority on rubber, has held many offices since joining ACS. A more complete story on the election and biographical details of Dr. Fisher's life will appear in the January, 1953, issue of RUBBER AGE.

Elected Dewey & Almy President

Hugh S. Ferguson

Directors of the Dewey & Almy Chemical Co., Cambridge, Mass., have elected Hugh S. Ferguson to take office as president and chief executive officer of the company on January 1, 1953, when Bradley Dewey, who has been president since the company was founded in 1919, retires from that office. Mr. Dewey has been elected chairman of the board of directors. Mr. Ferguson has been associated with the company for 28 of its 34 years and has been executive vice-president since 1948. A graduate of Massachusetts Institute of Technology in engineering administration, Mr. Ferguson has had an active part in all phases of the company's growth. He was elected a director of the company in 1927, treasurer and general manager in 1930, vice-president in 1944 and executive vice-president in 1948. He is vice-president of the Massachusetts Institute of Technology Alumni Association.

Establishes Executive Office

Kentucky Synthetic Rubber Corp., a company made up of 19 non-tire rubber manufacturers for the operation of the government-owned synthetic rubber plant at Louisville, Ky., has established a small executive office at 346 Post Road East in Darien, Conn. The Darien office will be headed by Dr. Henry F. Palmer, vice-president and formerly plant manager in Louisville. Operating headquarters of the company will continue at the Louisville plant. Darien was selected as the best location for the new office because it is centrally located to most of the companies participating in Kentucky Synthetic and is easily accessible. It was pointed out that 17 of the 19 companies involved have headquarters in the Middle Atlantic States. Thomas Robins, Jr., president of Kentucky Synthetic, is also president of Hewitt-Robins Inc., one of the participating companies.

G-E has made available a new booklet describing the company's complete line of hook-on instruments. Address the company at Schenectady 5, N. Y., and ask for GEC-901.

Piccopale Synthetic Resin

Pennsylvania Industrial Chemical Corp., Clairton, Penna., has introduced "Piccopale," a polymerization product obtained by catalytic reaction under carefully controlled conditions. It is a mixture of monomers having an average molecular weight approximating 90, composed essentially of dienes and reactive olefins to produce a hard solid resin with a resulting average molecular weight approximating 1100. According to the company, Piccopale appears to be methylated paraffin chains containing only a limited amount of unsaturation either of trans type II or terminal double bonds.

With a specific gravity of .970 to .975 (at 25/25° C.) the material finds many uses in the rubber industry. Of thermoplastic solid form, it has a softening point of 100± 3° C. (Ball and Ring). It weighs 8.12 pounds per gallon and has a flash point of 500° F. (C.O.C.), and a fire point of 520° F. Its refractive index is 1.5116 (at 20° C.). As to its chemical properties, it has an acid number of less than 1 and a saponification number of less than 2, while its ash content is 0.2% (maximum). Its iodine value is 120 (WIJS) and when corrected for substitution, 30. It has a bromine number of 7.3.

It may be used, as a softener in the manufacture of casings and inner tubes; as a tackifier in solvent-type rubber cements and in latex cements; as a compounding aid in rubber footwear; as an impregnant in the manufacture of waterproof fabric; as a reclaiming agent in the manufacture of pale reclaimed rubber either by the pan digester or open mill type; as a hardening, leatherizing and dispersing aid in miscellaneous industrial and mechanical goods; in latex compounding for rubberized fabrics, and in miscellaneous rubber specialties and latices. This new synthetic resin provides good chemical resistance, pale initial color, excellent compatibility and ready solubility. Complete data and samples are available from the company.

Cabot Expands Research Staff

Godfrey L. Cabot, Inc., Boston, Mass., has announced that the staff of its Research and Development Department in Boston has been expanded to include eleven additional chemists and chemical engineers. New members of the Applied Research Section include Frank A. Magno, Louis F. Sola, and Henry P. Donohue; Applications Research and Technical Service Section, Willard F. Roemelt, Richard V. Does, W. Gerald Burbine, and William J. Casey; Fundamental Research Section, Joseph P. Hall and Robert W. Dingman; Organic Research Group, Joel Yancey. Thomas E. Stretton, new to the Process Design and Economics Section, Research and Development Department, was formerly a member of the Cabot Economics Department until his recent transfer.

Flexible Tubing for ventilation, fume and dust removal, and materials handling is described in a new 8-page bulletin available from the Flexible Tubing Corp., Guilford, Conn. Ask for Catalog C2-4.

Yoquelet Named General Manager

Glen E. Youquelet

Glen E. Yoquelet, vice-president and treasurer of the Auburn Rubber Corp., Auburn, Ind., has been named general manager of the firm succeeding the late David M. Sellew. Also a director of the company, Mr. Yoquelet has been serving as assistant general manager for several years. Before joining Auburn Rubber in 1939, Mr. Yoquelet was district office manager and district office accountant for the Firestone Tire & Rubber Co. He was also associated with the Auburn Automobile Co. for ten years serving in various capacities including the position of chief accountant. Under the company's new stock ownership plan, every executive, supervisor, foreman and key employee is a stockholder in the company, and controlling interest in the corporation's outstanding stock is now vested in this group.

"Lage Safe Mat" Paper Sheet

A new disposable paper sheet, absorbent on one side and waterproof on the other, has been developed by Brown-Bridge Mills, Troy, Ohio. This sheet was originally developed for use in hospitals as a flexible, waterproof, barrier between the patient and the mattress. Many other home, hospital and industrial uses have since developed. The company is now looking toward the packaging field as a promising market. The sheeting, called "Lage Safe Mat," is odorless, does not rustle, stays in place, and absorbs perspiration. Lage Safe Mat is made from special paper. The waterproof coating on one side is Geon polyvinyl chloride plastic latex. The mat is available in rolls 36 inches wide by 300 feet long. The sheet sizes are 9 by 14 inches for bassinets, 18 by 24 inches for general use and 36 by 43 inches for standard hospital beds. The sheeting can be sterilized by autoclaving.

Adex Manufacturing Co. has announced the removal of its general offices, research and control laboratories, and the entire factory to larger, more modern quarters at 140 N. Kresson St., Baltimore 24, Md.

BRAZILIAN TIRE INDUSTRY SEES INCREASED PRODUCTION IN 1952

Plans for Brazil's tire industry in 1952 call for a production of about 1,820,000 units, according to recent reports from that country. This would be an increase of 27% over 1951 output of 1,435,379 units. The 1951 total was composed of 664,423 heavy truck and bus tires, 650,516 tires for passenger cars, 50,327 for light trucks, 25,064 for farm tractors, 19,741 for motorcycles, 12,712 for sundry industrial vehicles, 5,294 for farming equipment in general, 4,536 for airplanes and 2,856 for bulldozers and other earth-moving equipment.

This year's program has been aimed at a total of nearly 900,000 tires for heavy trucks and buses, and over 820,000 for passenger cars. All other categories of tires have also been increased, except for motorcycle units, which are planned to reach a total of about 6,900 for the present year. There may be a need for an expansion of this program in 1953 to provide for a total of 2,100,000 units in order to keep Brazil's more than half a million vehicles rolling.

Meanwhile, a threatened rubber shortage for Brazil's booming industries, which made it necessary to import from Singapore, may be in the process of being averted. Brazilian rubber production, which was 23,133 tons in 1950, climbed to 25,770 in 1951, and estimates for 1952 point to a figure of 32,000 tons.

Efforts on the part of the Brazilian government to curtail the need for importing rubber, have included the setting up of the Amazon Credit Bank, which has been giving full support to rubber producers. Plans to develop Brazil's natural rubbber have not been restricted to the Amazon region, however.

Recent reports were to the effect that rubber is being energetically cultivated at the Fazenda Bôa Esperança, in Sao Paulo, while in the state of Bahia, heretofore traditionally a cocoa-growing region, vast plantations are arising at Una and Canavieras. More than 1,000,000 rubber trees are now in production in these two localities and the rubber is said to be of high quality.

Brazil's Ministry of Agriculture has established a rubber research post at Una to assist producers in obtaining best results. Meanwhile, a local rubber industry is also arising in the state of Bahia, especially in the municipality of Ilhéus.

Brazil's rubber industry, according to a recent survey, is the fastest growing industrial activity in the country, with a figure of 1,035% increase over the period. A further sign of the great attention to this industry is the recent report to the effect that synthetic rubber may be manufactured at a plant established in Sao Paulo utilizing alcohol-butadiene.

General Export & Import Co., Inc., of 150 Nassau St., New York 38, N. Y., has changed its name to the International Rubber Corp., with headquarters at the same address. The telephone number is: DIgby 9-3760.

News in Brief

Midwest Rubber Reclaiming Co., East St. Louis, Ill., has issued a technical report on "Zinc Oxide as an Activator with Reclaimed Rubber." Ask for Report No. 18.

The Eastern Region Sales office of the Fibre Drum Division, Continental Can Co., formerly located at 330 West 42nd St. in New York City, has moved to 100 East 42nd St., New York 17. The telephone number is MU-3-4100.

Tenney Engineering, Inc., 26 Avenue B, Newark 5, N. J., has announced a new two-color four-page bulletin on its standard line of temperature-humidity test chambers. Ask for Bulletin TR.

Fisher Scientific Co., 717 Forbes St., Pittsburgh, Penna., has made available a new edition of the "Manual of Laboratory Safety." Copies are available on request.

Issue No. 2 of the Hycar Latex Newsletter published by Goodrich Chemical, contains information on new literature which is available; the use of Hycar latex in leather finishes and paints; curing systems for Hycar latices; Hycar latex backing for weatherstripping felt; and Hycar latex-Vinsol adhesives.

As the result of increasing demands for soil conditioners, Goodrich Chemical has expanded plant facilities for the volume production of sodium polyacrylate, basic ingredient used in making the conditioners.

American Wheelabrator & Equipment Corp., Mishawaka, Ind., has announced that "Anarust," a liquid rust inhibitor for wet blasting machines, is available from stock.

Dickens, Inc., Chicago, Ill., has introduced a new type of disposable package made of Bakelite polyethylene film for dental elastic cream.

"The Story of Licorice," believed to be the first comprehensive history of the subject, has been published in an illustrated booklet by MacAndrews & Forbes Co., New York, N. Y.

Columbia-Southern Chemical Corp. has issued another in its series of Pigment Data Bulletins. Number 52-4 deals with Calcene N. C., the company's new fine particle precipitated calcium carbonate product.

A new booklet released by Goodrich entitled "Roll Call" lists all the different motor vehicles which have been introduced in the United States by year.

Warwick Chemical Co. has announced the availability of a new booklet describing Sulfanole KB-40, an all-purpose surfactant of the alkyl aryl sulfonate class.

Thomas A. Edison, Inc., has announced a college training program for laboratory assistants in the Edison Laboratory, the central research laboratory for the company.

GOODRICH AND GULF OIL FORM GOODRICH-GULF CHEMICALS, INC.

B. F. Goodrich Co. and the Gulf Oil Co. have announced a joint venture into the petrochemicals field. The two have announced that they have formed a jointly-owned subsidiary, Goodrich-Gulf Chemicals, Inc., with headquarters in Pittsburgh, Penna. The new company has already purchased 700 acres adjacent to the Allied Chemical & Dye Corp. at Orange, Texas, and while it has not been confirmed, it is believed that the plant may manufacture Butyl rubber.

Goodrich-Gulf plans an initial investment of $5,000,000. Stock ownership will be held equally by the parent organizations. The new company will explore projects in the petrochemical field in which the parent companies have strong complementary interests. However, freedom of the individual companies in the chemical field will not be restricted, it was emphasized.

W. S. Richardson, newly-elected executive vice-president of B. F. Goodrich, has been named president of Goodrich-Gulf. William G. Moore, L. O. Crockett, H. P. Hobart, and Allan B. Sloss, all of Gulf Oil; and John R. Hoover, R. G. Jeter, Frank K. Schoenfeld and Mr. Richardson, all of Goodrich, have been named directors of the new company.

Goodrich began the manufacture of chemicals for its own use and for sale more than 50 years ago and is a pioneer producer of synthetic rubber in America. It was the largest producer of general purpose rubber in the U.S. before the government's establishment of large-scale rubber-making facilities. In 1945 it organized the B. F. Goodrich Chemical Co., a division of the parent company, to conduct its expanding activities in plastics, plasticizers, anti-oxidants, accelerators, special purpose synthetic rubbers, fungicides, and other special use chemicals.

Gulf Oil has long been an important producer of crude oil and a large manufacturer of petroleum products. For many years it has conducted research in the chemical field and has been producing aluminum chloride, sulfuric acid, and other chemicals. Gulf now has a large-scale program under way for manufacturing from petroleum and refinery gases, various basic chemicals for civilian and military use, including ethylene, higher alcohols, and other chemical intermediates.

Expanding Chemical Division

Goodyear Tire & Rubber Co. has announced plans for a $1,500,000 expansion program for its Chemical Division. Russell DeYoung, vice-president in charge of production, described the project as an addition to existing Akron facilities for the production of Chemigum. He said the expansion in the rubber chemical field will make available additional reactors for synthetic rubber used in industrial, architectural and highway paints; as reinforcing agents, and for a score of other applications. These facilities can also be used for the production of synthetic rubber latices which are being used extensively in water emulsion paints, and for paper and fabric coatings, he said.

Cabot Opens New Jersey Office

Bertram A. Wilkes

Godfrey L. Cabot, Inc., Boston, Mass., has opened a new sales office at New Brunswick, N. J., for the convenience of its customers in the New Jersey, Delaware, Maryland, Pennsylvania and Virginia areas. The new offices are located at the Citizen's Building, 40 Bayard St. in New Brunswick. The telephone number is KIlmer 5-1828-9. Bertram A. Wilkes has been named to head the new office. Mr. Wilkes has been a representative of the Cabot companies in this area for the past fifteen years. Associated with the company since 1929, Mr. Wilkes is a graduate of the Lowell Institute of the Massachusetts Institute of Technology and of the School of Business Administration of M.I.T. Charles R. Schroth, formerly associated with the H. N. Richards Co., Trenton, N. J., has also been named to the staff of Cabot's New Brunswick office.

Announce Joint Sponsorship

The American Society of Mechanical Engineers and the Society for the Advancement of Management will jointly sponsor the Plant Maintenance Conference, which will be held in Cleveland, Ohio, on January 19 to 22, 1953. The conference, which is to run concurrently with the Plant Maintenance Show, will include sixty-six separate sessions, including three panels, sixteen sectional conferences, forty-two roundtables, four plant tours and a banquet. The show also will be considerably expanded. Exhibits will cover more than 100,000 square feet. It is estimated that some 7,000 different products will be shown. Advance registration cards and information may be secured from Clapp & Poliak, Inc., 341 Madison Avenue, New York 17, N. Y.

United Carbon Transfers Rea

United Carbon Co., Inc., of Charleston, West Va., has announced the transfer of William S. Rea, general sales consultant with offices in New York City, to San Francisco, Calif., where he will act in a similar capacity. Mr. Rea will look after the interests of the company through the L. H. Butcher Co., carbon black sales representatives for United Carbon on the Pacific Coast.

ACS Announces Division Chairmen

The American Chemical Society has announced the election of new chairmen for three of the society's divsions. Arthur K. Doolittle (Carbide & Carbon) has been elected chairman of the Paint, Plastics and Printing Inks Chemistry Division for 1953, succeeding Francis Scofield (National Paint, Varnish and Lacquer Ass'n.). John K. Wise (U. S. Gypsum) was chosen chairman-elect. Professor Albert C. Zettlemoyer (Lehigh University) was named vice-chairman while Professor C. F. Brown (Bethany College) was elected secretary-treasurer. Professor Paul J. Flory (Cornell University) has been elected chairman of the Division of Polymer Chemistry for 1953 succeeding Dr. William E. Hanford (M. W. Kellogg). Dr. Raymond M. Fuoss (Yale University) was chosen vice-chairman while Dr. Herman F. Mark (Polytechnic Institute of Brooklyn) was re-named secretary-treasurer. Professor J. Henry Rushton (Illinois Institute of Technology) has been elected chairman of the Division of Industrial and Engineering Chemistry for 1953 succeeding Professor Melvin C. Molstad (University of Pennsylvania).

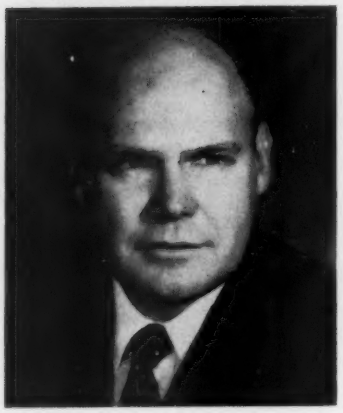
New Saran Plant for Israel

Dow Chemical International, Ltd., Midland, Mich., has granted a license to an Israeli manufacturer to produce Saran. The plant is being constructed in Rehovoth, Israel, by the United Saran Corp., Ltd., for the production of the plastic which was developed by Dow. Machinery and equipment will be shipped from the United States in the near future. Joseph Jacobson, a native of Israel and formerly assistant minister of defense, is managing director of the new corporation. The Winer brothers, officers and stockholders of the National Plastic Products Co., Odenton, Md., and Harry and Louis Levine of the Commonwealth Plastics Corp., Leominster, Mass., are the other principal stockholders of the newly-formed Israeli company. Key technical personnel for the plant are being trained in this country and they in turn will train Israeli natives in production methods. Basic materials will be shipped to Israel by Dow.

Goodyear Pliovic G90V

The first in a new series of Pliovic polyvinyl chloride resins has been announced by the Goodyear Tire & Rubber Co. Designated "Pliovic G90V," the new resin is described as a general-purpose, straight-vinyl material that has an approximate intrinsic value of 0.90. Outstanding thermal stability, a high bulk density for ease of handling, and easy interchangeability with other resins are claimed for the product. Pliovic G90V is expected to find its most extensive application in vinyl film and sheeting. Plant trials and laboratory tests have indicated that products made with Pliovic G90V exhibit low water absorption, relatively good flexibility at low temperatures, and other desirable physical characteristics. The clarity of unpigmented compounds is reportedly exceptional.

Named Manufacturing Manager



Wilfred J. Mohr

Wilfred J. Mohr, formerly technical sales director of the Rubber and Asbestos Corp., Bloomfield, N. J., has been appointed manufacturing manager of the Southern Latex Corp., Austell, Ga., where he will be in charge of the plant and laboratory. Mr. Mohr attended the School of Engineering of the University of Manitoba, and then joined the Minnesota Mining and Manufacturing Co., first working at the research laboratory in St. Paul on rubber dispersions and adhesives, and subsequently in the Detroit laboratory. In 1945, Mr. Mohr joined the Flintkote Co., and in 1947 was placed in charge of the Flintkote rubber laboratory.

"Spray On" Surgical Dressing

The U. S. Air Force has disclosed that it is testing a "spray on" plastic surgical dressing for use in atomic attack as well as for other wounds and injuries. The transparent plastic dressing, called "Aeroplast," is sprayed directly on the injured parts of a victim's body from a pressurized container. Tests do date show that it makes gauze dressing unnecessary. Besides its quick application, the material has the advantage of transparency and easy removal. It can be applied by an untrained operative, is less expensive than gauze, and can be stored indefinitely in minimum space. Aeroplast is sprayed over a wound in a coating .005 of an inch thick. The plastic dressing was developed by the Air Force with the help of Protective Treatments, Inc. of Dayton, Ohio.

New Navy Specification

A new specification was recently issued by the Bureau of Ships of the Department of the Navy to cover a coated fabric packing which is used as a joint sealer and as a faying material. This military specification has been assigned number MIL-P-2829A and contains a qualification requirement that manufacturers submit specimens to be tested and approved before their products are acceptable for procurement. A formulation to cover this material has been developed as part of the Bureau of Ships Rubber Formulary and is available upon request to the Bureau.

CANADIAN GROUPS MEET JOINTLY TO HEAR PAPER BY E. B. STOREY

On November 13, 1952, the Ontario Rubber Section, the Kitchener Rubber Group and the Wellington Waterloo Section of the Chemical Institute of Canada met at Muirheads Restaurant in Kitchener, Ont., Canada. Featured speaker of the meeting was E. B. Storey of the Polymer Corp., Sarnia, Ont. Mr. Storey spoke on "A Laboratory Examination of Some Extrusion Variables." In his talk, Mr. Storey described experiments carried out by G. J. Briggs to evaluate the extrusion characteristics of chemical elastomers.

Mr. Storey noted that the divergent fields of application of specific elastomers makes it difficult to obtain a comprehensive correlation between their extrusion characteristics and the chemical and physical properties. The development of such a correlation was the aim of this work, he said.

The effects of die length and diameter, and worm speed, were determined for circular dies using a ½ Royle extruder and masterbatches of 50 PHR of EPC black with various elastomers. The volume rate of extrusion of the masterbatch was shown to be proportional to the pressure developed in the head of the extruder. Spring devices were described by which the pressure could be measured at the entry to the die tube and, by means of die extension tubes, at any point along the die tube. The pressure drop through the die tube was linear and varied directly as the ratio of the length to the diameter of the die tube. The volume rate-pressure relationship was characteristic of the elastomeric masterbatch in question.

The phenomena of die swell was related to a velocity gradient that was found to exist across the die tube section. The experiments showed that the die swell was not affected by the type of metal employed for the die. This effect could be explained by assuming that there was a small, but finite, velocity of the masterbatch at the die tube wall. An increase in the worm speed, or in the die tube ratio of length to diameter, resulted in an increase in the velocity gradient and, hence, the die swell.

The temperature of the extruded material, and the effect on its scorch characteristics, was directly related to the worm speed and was not affected to a large degree by the dimensions of the die, Mr. Storey pointed out.

The constants of an exponential flow equation relating the shear stress and the rate of shear during the extrusion process could be evaluated with the die extension tubes and spring device. The flow equation gives a mathematical description of the proecssing properties of the elastomer, he concluded.

New Technical Tape Subsidiary

Technical Tape Corp., New York, N. Y., is extending its manufacturing facilities to the Pacific coast through a new subsidiary, Technical Tape Corporation of California. The new company will produce specialty tapes in a three-building plant now being equipped in Burbank, Calif.

"Polyform" Self-Sealing Bandage

"Polyform," a self-sealing, adjustable dressing cover and pressure bandage is currently being marketed in the United States after several years of success in Europe. The multi-purpose bandage, produced by the J. Werman Laboratories of Antwerp, Belgium, is being distributed here by G. Bacchus & Co. of New York City. The bandage, composed of highly sterile and antiseptic natural crepe rubber does not stick to the skin, hair or gauze, but sticks to itself. The company also claims that it will not loosen in water, soap, moisture and is highly elastic for free movement of the joints. It is easy to remove and leaves no sticky residue after removal. Currently in use by both the Belgium and French Red Cross, the bandage is produced by Werman in Germany, France, England and Switzerland. Production is expected to start shortly in Italy, Brazil, Argentina and Canada.

Named in Federal Tax Lien

L. M. Bickett, president of the company bearing his name in Watertown, Wisc., has been named in a $13,921.95 tax lien filed in Federal Court recently. Government officials said the lien was for additional taxes owed from 1943 to 1945. A $20,578.25 tax lien was previously filed against the firm.

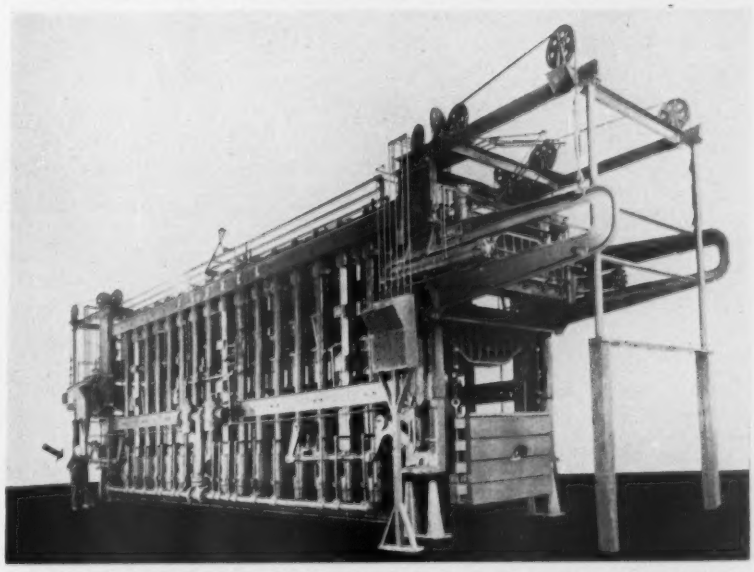
Distributing Hatco Plasticizers

Harwick Standard Chemical Co. has added the high purity plasticizers produced by the Hatco Chemical Co. to its line. Because of their high purity (99.7% minimum ester content), these products are said to give better plasticizing efficiency than conventional plasticizers. In addition, in achieving this high ester content, all impurities such as aldehydes and ketones have been removed by a new process developed and perfected by Hatco Chemical. Harwick Standard is now representing Hatco Chemical's dicapryl phthalate, di-iso-octyl phthalate, dibutyl phthalate, didecyl phthalate, dioctyl sebacate, and dibutyl sebacate.

Neolite Used for Shoe Uppers

Goodyear Tire & Rubber Co. has developed a form of Neolite which is thin enough for use in shoe uppers. The material, the company says, has all the properties of leather plus distinctive characteristics of its own. Shoes capped with Neolite will "wear longer, retain their appearance better, cost less and be more comportable than those topped with leather," company officials said. The company says it has shoes made with the material already available but only by special order. Full production, it states, will be reached by April and shoe manufacturers will distribute the product nationally at that time.

GOODYEAR INSTALLS WORLD'S LARGEST CONVEYOR BELT PRESS IN AKRON



What is said to be the largest conveyor belt press in the world has been installed on the flat belt production lines of the Goodyear Tire & Rubber Co. at Akron, Ohio. The 41-foot long press uses up two floor levels, and plant buildings had to be revised for installation. Designed and built by the Farrel-Birmingham Co., with the aid of Goodyear belting engineers, the gigantic press, more than 84 inches wide, is capable of vulcanizing conveyor belts up to 72 inches wide. The belt press is arranged with equipment at each end to enable it to take up to a 20 ton belt. The equipment allows 1,500 pounds of working pressure on each of the thirty-two 18-inch diameter rams which in turn give 275 pounds per square inch pressure on press plates. The press covers an area of 2,500 square feet including wind-up, let-offs and piping. It weighs over 500 tons, exclusive of wind-ups and let-offs. In the photograph of the press above, the arrow at the left points out a company employee as an indication of the size of the unit.

FINANCIAL NEWS

Rempel Manufacturing, Inc.

Year Ended June 30: Net profit of $55,576, which compares with a net profit of $58,565 in the 1951 fiscal year. Both earning figures are after taxes and profit-sharing. Rempel distributed $36,066 in profits to employees in the 1952 fiscal year, as aganst $34,739 in the year before. Sales in the 1952 fiscal year rose to a new high of $1,667,301, against $1,496,000 in the previous twelve months. The company has revealed that it has set a goal of $1,750,000 for rubber toy sales, plus $1,250,000 in government sales, or a total volume of $3,000,000 for the year ended June 30, 1953. Government sales hit $278,000 in 1952 and $10,000 the previous year. Rempel will have doubled its facilities for making toys by the end of 1952 with an expenditure of $30,000. In a lttle over a year, floor space was increased from 40,000 to 85,000 square feet.

Goodyear Tire & Rubber Co.

Nine Months to September 30: Estimated net income of $27,609,612, which is equal to $6.13 a common share, compared with $27,682,020, or $6.18 a share, in the first nine months of 1951. Consolidated net sales in the first nine months of 1952 amounted to $853,933,430, against $861,828,231 in the first nine months of the previous year. The report emphasizes that sales in 1952 wll set another new record for the rubber industry. Goodyear became the first firm to break into the billion-dollar class last year when it did a total business of $1,100,000,000.

New Jersey Zinc Co.

Nine Months to September 30: Consolidated net income of $10,035,454, which is equal to $5.12 a share, compared with $6,872,415, or $3.51 a share, in the first nine months of 1951. The earnings for the 1952 period included a $529,656 profit on sales of securities and $4,250,000 proceeds from sale of patents, which after taxes amounted to $3,145,000, or $1.60 a share. Last year the company had a loss of $36,175 on securities sales.

Minnesota Mining & Mfg. Co.

Nine Months to September 30: Net profit of $11,442,337, which is equal to $1.39 per common share, compared with $11,427,754, or also $1.39 a share, in the first nine months of the preceding year. Net sales in the first nine months of 1952 totaled $133,778,460, highest in the firm's 50-year history. This compares with $126,810,666 in the first nine months of 1951.

Resistoflex Corp.

Year Ended June 30: Net income of $61,292, which is equal to 17c a common share, compared with $139,920, or 42c a share, in the previous fiscal year.

Belden Manufacturing Co.

Nine Months to September 30: Net income of $687,752, which is equal to $2.15 a share, compared with $891,298, or $2.78 a share, in the first nine months of the previous year. Net sales in the first nine months of 1952 totaled $15,806,221, against $18,838,535 in the first nine months of 1951.

Thermoid Company

Nine Months to September 30: Net profit of $654,111, which is equal to 70c a common share, contrasted with $1,409,539, or $1.64 a share, in the first nine months of 1951. Gross sales in the first nine months of 1952 totaled $29,057,867, against $30,527,064 in the corresponding period of the previous year.

Dewey & Almy Chemical Co.

Nine Months to September 30: Net profit of $230,730, which is equal to 25c a share, compared with $1,043,500, or $1.14 a share, in the first nine months of the preceding year. Net sales in the first nine months of 1952 amounted to $20,597,899, against $22,052,698 in the first nine months of 1951.

American Hard Rubber Co.

Forty Weeks to October 5: Net income of $124,621, which is equal to 14c a common share on net sales of $13,904,219, compared with $679,756, or $2.17 a share, on net sales of $17,685,511 in the corresponding period of 1951.

Swan Rubber Co.

Year Ended July 31: Net income of $753,092, which is equal to $1.18 a common share on net sales of $11,386,445, compared with $1,019,250, or $1.59 a share, on sales of $13,871,059 in the previous fiscal year.

Anaconda Wire & Cable Co.

Nine Months to September 30: Net income of $4,715,659, which is equal to $5.59 a capital share, contrasted with $4,097,527, or $4.86 a share, in the corresponding period of the previous year.

O'Sullivan Rubber Corp.

Nine Months to September 30: Net income of $114,222, which is equal to 23c a common share, compared with $172,656, or 38c a share, in the corresponding nine months of the previous year.

General Cable Corp.

Nine Months to September 30: Net income of $3,618,489, which is equal to $1.61 a common share, contrasted with $3,679,997, or $1.62 a share, in the first nine months of 1951.

B. F. Goodrich Co.

Nine Months to September 30: Estimated net income of $23,008,681, which is equal to $5.36 a common share, compared with $24,500,272, or $5.75 a share, in the first nine months of the preceding year. Consolidated net sales for the first nine months of 1952 declined 5.4% to $453,938,658 from the $479,956,064 in the nine months ended September 30, 1951.

Seiberling Rubber Co.

Nine Months to September 30: Net profit of $671,876, which is equal to $1.69 a share, compared with $1,005,989, or $2.78 a share, in the first nine months of 1951. Net sales in the first nine months of this year totaled $31,192,329, down 7% from the $33,069,331 reported for the first nine months of 1951.

National Rubber Machinery Co.

Nine Months to September 30: Estimated net profit of $471,000, which is equal to $2.68 a share, compared with $487,495, or $3.16 a share, for the nine months ended September 30, 1951. Sales in the first nine months of 1952 were about $14,000,000, against $7,474,520 in the first nine months of the preceding year.

Columbian Carbon Co.

Nine Months to September 30: Net income of $2,906,655, which is equal to $1.80 a share on sales of $34,608,379, compared with $3,551,878, or $2.20 a share, on sales of $38,224,445 in the first nine months of 1951.

United Carbon Co.

Nine Months to September 30: Net income of $2,582,971, which is equal to $3.25 a share, contrasted with $2,703,972, or $3.40 a share, in the first nine months of the preceding year.

Raybestos-Manhattan, Inc.

Nine Months to September 30: Net profit of $2,131,273, which is equal to $3.39 a share, compared with $3,347,466, or $5.33 a share, in the first nine months of 1951.

Vinyl Recommendations Revised

Sixteen styles of vinyl-coated sheetings have been added to an original list of 20 vinyl-coated fabrics and 25 pyroxylin-coated fabrics in a revision of the Simplified Practice Recommendation for Vinyl and Pyroxylin-Coated Cotton Fabrics to become effective January 1, 1953. Approved for promulgation by the Commodity Standard Division, Office of Industry and Commerce, U. S. Department of Commerce, the revised recommendation will be identified as R242-53. In announcing the revision, the Commerce Department stated that increased demand for vinyl-coated sheetings made the addition of these materials to the simplified lists advisable. The Department was assisted in developing the revised recommendation by users and distributors of the materials and by the materials' manufacturers working through the Plastic Coatings and Film Association.

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NAMES IN THE NEWS

DR. HERBERT FINEBERG, chief chemist of the Glyco Products Co. since 1948, and previously chief chemist for the Connecticut Hard Rubber Co., has been promoted to the position of director of research for Glyco Products.

DR. ERNEST O. OHSOL, formerly associated with the General Electric Co., has joined the Pittsburgh Coke & Chemical Co. as director of chemical engineering.

THOMAS D. CABOT, vice-chairman of the board of directors and executive vice-president of Godfrey L. Cabot, Inc., has been elected a board member of the National Industrial Conference Board for a term of one year.

MAXWELL I. SCHULTZ, until recently executive vice-president of the Willmark Service System, Inc., has been elected executive vice-president and general manager of the Technical Tape Corp.

RANDOLPH B. WEST, JR., associated with the Goodyear Tire & Rubber Co. for the past 18 years, has been named assistant factory personnel manager succeeding HUGH HILLIARD, who was recently appointed manager of industrial relations for the new Goodyear Atomic Corp.

JOHN W. SOLOMON, formerly general sales manager of the Textile Division of the U. S. Rubber Co., has been named sales assistant to the vice-president and general manager of the division. V. C. MCQUIDDY, associated with the company since 1941, has been named sales manager of the division.

GEORGE E. WEPPLER, one-time production manager of the Technical Tape Corp., has been elected vice-president in charge of manufacturing operations of the L. E. Waterman Co.

DR. GLENN H. MCINTYRE, vice-president of the Ferro Corp., has been named technical director in addition to his present duties. ORVILLE O. KENWORTHY has been named director of research for the company.

D. W. HODGES has been appointed New England representative for Brown Chemicals, New York, N. Y. He will maintain headquarters at 100 Boylston St., Boston, Mass.

ROGER S. SWEENEY has been appointed vice-president and general manager of the Watson-Stillman Co., division of the H. K. Porter Co., Inc.

HAROLD C. WHITTEMORE, JR. has been appointed vice-president of the Warwick Chemical Co., a division of the Sun Chemical Corp.

JACKSON KEMPER has been appointed general manager of the Fittings Division of the Watson-Stillman Co., Roselle, N. J. Watson-Stillman is a division of the H. K. Porter Co., Inc.

CARROLL C. PARKER has been appointed assistant manager of grinding wheel sales for the Mechanical Goods Division of the U. S. Rubber Co., with headquarters at Fort Wayne, Ind.

L. F. HICKERNELL, chief engineer of the Anaconda Wire & Cable Co., Hastings-on-Hudson, N. Y., has been elected a member of the board of directors of the American Institute of Electrical Engineers.

HARVEY S. FIRESTONE, JR., chairman of the board of the Firestone Tire & Rubber Co., was recently honored for his services to the cause of better intergroup relations by the Automotive Division of the National Conference of Christians and Jews.

WILLIAM O'NEIL, president of the General Tire & Rubber Co., and DAVID BERNSTEIN, an executive of the American Biltrite Rubber Co., were recently honored at a testimonial dinner in New York City for their contribution to the founding of the state of Israel.

JACK MCKERNAN, foreman of the rod mill of the Hastings-on-Hudson plant of the Anaconda Wire & Cable Co., was recently presented with a gold watch marking his fifty years of service with the company.

HARRY J. CARROLL, a member of the Traffic Department of the Goodyear Tire & Rubber Co. since 1910 and its director of traffic for the past two years, has been elected a national vice-president of the National Defense Transportation Association

HAROLD J. BALDWIN, formerly associated with the Seiberling Latex Products Co., has joined the Industrial Relations Department of the Midwest Rubber Reclaiming Co.

W. G. "GUY" HOFFMAN, who retired in 1951 after 50 years service with the U. S. Steel Co., has been named West Coast representative of the Aetna-Standard Engineering Co. He will maintain offices at San Mateo, Calif.

L. A. MELSHEIMER, formerly in charge of the Technical Service Laboratory, Pigment Department, of the Calco Chemical Division, American Cyanamid Co., has been named manager of technical promotion for the Pigment Department.

R. P. MOLITOR, formerly associated with Bauer & Black, a division of the Kendall Co., has joined the Gun Rubber Co.

MERLE F. SCHREURS, formerly associated with Industrial Ovens, Inc., has joined the Plastic Materials Group of the B. F. Goodrich Chemical Co., where he will head the Practical Fabric Coating Techniques and Processes Section.

WILLIAM T. STEPHENS, formerly vice-president and general manager of the Valve Service Co., Willoughby, Ohio, has joined the Parker Appliance Co. as Staff engineer in charge of the company's development of industrial hydraulic equipment.

CHARLES ALLEN THOMAS, president of the Monsanto Chemical Co. and chairman of the board of directors of the American Chemical Society, has been chosen to receive the highest award in American industrial chemistry, the Perkin Medal of the American Section of the Society of the Chemical Industry for 1953.

W. G. "BILL" NELSON, long associated with the tire plant of the U. S. Rubber Co. at Detroit, Mich., is reported to be recuperating from serious contusions suffered in a recent automobile accident. He has been confined to his home for some time.

FRED CASE, associated with the Essex Rubber Co. at Trenton, N. J., for some time as factory manager, recently left that organization. He has not announced his future plans.

JOHN C. DUDLEY, associated with the rubber laboratory of the Chrysler Corporation at Detroit, Mich., for many years, recently left that organization. A farewell dinner was tendered to him on October 30 by his many friends in the industry.

PAT AVOLIO was recently made chief chemist for Stokes Molded Products, Inc., Trenton, N. J., succeeding W. DERMODY who has been given a special engineering assignment with the company.

Hercules Opens Akron Office

To provide more effective service for the rubber industry, the Hercules Powder Co. has opened a new branch sales office at 7 West Bowery St., Akron, Ohio. Hercules Powder produces resins, rosin soap emulsifiers, and hydroperoxides used in the manufacture and compounding of synthetic rubber. Manager of the Akron office will be Clifford S. Reppe, formerly manager of the Hercules Powder Co. (Canada) Ltd., Burlington, Ont. Mr. Reppe, a graduate of the Northwestern College of Law and the American Institute of Banking, was engaged in banking in Portland, Ore., from 1926 to 1937. Since 1937, he has been with Hercules Powder's Paper Makers Chemical Department serving as office manager at Portland, technical representative at Holyoke, Mass., and sales manager at Burlington. He was in the Army during World War II, and holds the rank of Major in the Finance Department Reserve. Succeeding Mr. Reppe at Burlington is Raymond M. Bishop, who was assistant manager.

Goodrich Promotes Richardson

William S. Richardson

William S. Richardson, formerly vice-president of the B. F. Goodrich Co., has been elected executive vice-president and a member of the Executive Committee of the board of directors of the company. In the rubber industry since 1914, Mr. Richardson was named president of the B. F. Goodrich Chemical Co. when it was organized in 1945. He joined Goodrich in 1926 as manager of the Planning Department in Akron. Two years later, he became staff superintendent of the company's Industrial Products Division. In 1931, Mr. Richardson was named merchandising manager of the division. He moved up to division general manager in 1938 and general manager in 1941 of the Industrial and General Products Sales Division. He was elected vice-president of the parent company in April, 1951. Mr. Richardson is a veteran of World War I. During World War II, he was chairman of the OPA Mechanical Rubber Goods Industry Advisory Committee. He is a member of the board of directors of the Manufacturing Chemists Association and, presently, vice-president of the organization.

McCreary Stock to Charity

Harry C. and Ralph W. McCreary, owners of the McCreary Tire & Rubber Co. of Indiana, Penna., have announced plans to give 90% of the company's stock to charity to carry out the wishes of their late father, founder of the company. The stock will soon be turned over to the McCreary Foundation, now in the process of formation. The institution will use the dividends for non-sectarian religious, charitable and educational purposes. The late Harry McCreary, his wife and two sons broke ground for the company in April, 1914. He explained that he was undertaking the venture primarily "for the glory of God and the furtherance of His kingdom here on earth through profits earned by the new industry," the brothers said. Valued by the co-owners at $1,500,000, the firm marketed $6,446,000 worth of rubber goods last year.

Management Changes at Mansfield

M. L. Bayer has been named factory manager and H. P. Partnenheimer has been named director of research and development in a revision of the production and technical departments of the Mansfield Tire & Rubber Co. Prior to their new appointments, Mr. Bayer was general plant superintendent, and Mr. Partenheimer was manager of the Development Department. Mr. Bayer is a veteran of 20 years in tire and tube production while Mr. Partenheimer has been a tire engineer in construction, design and compounding for 35 years. Before coming to Mansfield Tire in 1941, Mr. Partenheimer was with the B. F. Goodrich Co. at Akron and Kitchener, Ont., Canada, as well as with the Fisk Rubber Co., Chicopee Falls, Mass. Other changes in the Development and Research Departments involve new positions for five other Mansfield Tire personnel, all reporting to Mr. Partenheimer.

Robert C. Hudson, formerly development engineer, has been named manager of product design and construction. He was associated with the Firestone Tire & Rubber Co. before coming to Akron. Roscoe M. Gage, formerly manager of the Technical Division, has been appointed manager of compound development. With Mansfield Tire since 1933, he was previously associated with the Portage Rubber Co. (now Seiberling Rubber), Vulcan Rubber Co., Hood Rubber Co., and Fisk Rubber. F. Kenneth Miller has been named manager of field engineering and product testing. He was formerly product development engineer and before joining Mansfield Tire was with James C. Heintz & Co. and Goodyear Tire. Charles P. Wilcox, formerly head of mold engineering, has been appointed manager of mold design. He was with Fisk Rubber before coming to Mansfield Tire in 1933. Bernard M. Mahoney, formerly manager of the Specifications Department, has been named manager of statistical quality control.

R. V. Schotta, D. H. Landers and H. H. Forrest, previously shift and divisional superintendents, have been named special assistants to Mr. Bayer. Five new departments have been created, each headed by a general foreman. The following have been named to these posts: J. A. Willard, in charge of Banbury mixing, calendering and tread tubing; William Dormaier, in charge of stock preparation, beads and tire building; Samuel Johnson, tire curing and air bag departments; and Robert T. Murphy, tire final finishing, inspection and repair. The fifth general foreman in charge of inner tubes is yet to be named.

John Hewson Co., New York, N. Y., has opened a new sales office at 6349 North Western, Chicago, Ill., with Robert H. Metz, Jr., as district manager in charge of sales.

Tired of waiting for this copy of RUBBER AGE to reach your desk? Can your office use another copy? Use the coupon on page 417.

Essex Rubber Promotes Cox

Joseph E. Cox

Joseph E. Cox, active in rubber sole and heel manufacturing for the past twenty-five years, has been named resident manager of the Essex Rubber Co. of Trenton, N. J. The appointment was announced by George S. Fabel, president of the Thermoid Co., also of Trenton, which purchased stock control of Essex Rubber in 1951. Mr. Fabel said an aggressive sales and product development program will be carried out at Essex Rubber under the direction of Mr. Cox. A native of Kentucky, Mr. Cox is a graduate of Southwestern University and saw overseas duty during World War I as a first lieutenant in the field artillery. Following the war he entered the export business, and in 1925 joined the Goodyear Tire & Rubber Co. Before joining Essex Rubber in 1946, he had been assistant general manager of Goodyear's Shoe Products Division.

Warcosine Ceresine-Type Wax

Warwick Wax Co., Inc., a subsidiary of the Sun Chemical Corp., has announced the availability of "Warcosine," a new, white ceresine-type wax. Warcosine is produced by the Cooperative Refinery Association, Coffeyville, Kansas. It has been developed for manufacturers of rubber compositions, paper, products, etc. Warwick Wax is the exclusive sales agent for the product. Warcosine is not a blend of waxes. It is obtained from the solvent extraction of selected crudes and combines some of the characteristics of fully refined paraffin with the highest quality plastic micro waxes, Warwick Wax states.

Parker Appliance Promotes Two

E. L. Carlotta, who since 1950 has headed rubber sales for the Parker Appliance Co., Cleveland, Ohio, has been made manager of all rubber research and development for the company. Succeeding him as manager of rubber sales is Frank A. Depatie, who has been engaged in sales work for Parker for the past three years. Mr. Carlotta is a graduate of the University of Pittsburgh and has been associated with the company since 1941. Mr. Depatie attended the University of Detroit and joined the company in 1948.

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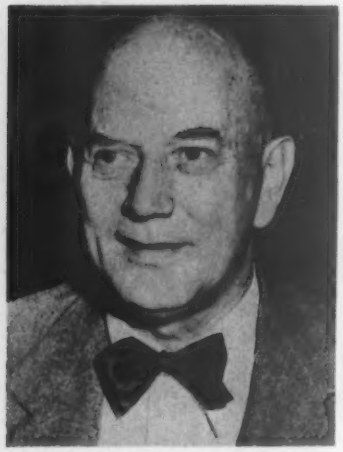


Seward G. Byam

As reported in the November issue of RUBBER AGE, Seward G. Byam, neoprene sales manager for E. I. du Pont de Nemours & Co., Inc., has been elected chairman of the Division of Rubber Chemistry of the American Chemical Society. Mr. Byam was born in Rome, N. Y., in 1894. He was graduated from Brown University with a Ph. B. degree in 1916. For the next two years he was associated with the U. S. Rubber Co., and then served two years with the Army's Bureau of Aircraft Production in Pittsburgh, Penna. After World War I, he joined DuPont as a chemist in the Fairfield, Conn., plant. Mr. Byam left the company in 1921 to become chief chemist of the Plymouth Rubber Co., Canton, Mass., and later became factory manager of that company. Returning to DuPont in 1925, Mr. Byam became assistant plant manager of the Fairfield plant, and in 1932 moved to Wilmington to join the Rubber Chemicals Division sales office. A member of the American Chemical Society for 24 years, Mr. Byam has been a director of the Division of Rubber Chemistry, and advertising manager of the division's publication, *Rubber Chemistry and Technology*, for 14 years. He was delegate-at-large of the division for one year and was representative of the division on the council of the national society for three years.

Materials Handling Show Plans

The Fifth National Materials Handling Exposition, which will be held at Convention Hall in Philadelphia, Penna., on May 18 to 22, 1953, will be the largest capital goods show to be held anywhere in the country during 1953, according to Clapp & Poliak, Inc., the exposition management. The exposition, held for the first time in 1947, is expected to attract 25,000 visitors from 40 countries. The Material Handling Institute will handle the exhibition. Concurrently with the show, the American Materials Handling Society will conduct a series of conferences. Advance registration cards and detailed information may be obtained from the exposition management at 341 Madison Avenue, New York 17, N. Y.

Pycal 70 Plasticizer

Atlas Powder Co., Wilmington, Del., has released some new information on its "Pycal 70" auxiliary plasticizer for polyvinyl chloride films and filled sheeting. The product finds use as the low-temperature plasticizer in blends with such standard plasticizers as the phthalates and the phosphates. Pycal 70, according to the company, shows lower volatility characteristics than other low-temperature plasticizers, and also presents costs advantages. Low-temperature flexibility imparted by the material to films and sheetings is said to be equivalent to that given by the adipates. Other physical properties, such as tear strength, tensile strength, elasticity and "hand" are also equal or superior to those imparted by the adipates. Pycal 70 is a phenoxyethyl oleate and owes its low volatility to high molecular weight. It shows less loss than other low-temperature plasticizers in the standard oil immersion tests, Atlas Powder states, and much less extraction by soap solutions. It compares favorably in water immersion tests. Unlike most fatty acid esters, Pycal 70 has excellent resistance to rancidity.

To Triple Filatex Capacity

American Viscose Corp. expects to more than triple its poundage capacity of "Filatex" elastic yarn by the first of the year. The company said two new machines being installed at its Roanoke, Va., plant will extrude latex in cylindrical form and permit a range of sizes from under 18's to 125's. Under present manufacturing methods the Filatex Division of the company cannot make yarns coarser than 65's. The Roanoke expansion is primarily intended to meet increased demand for coarse threads for braiding and narrow fabrics. The new production facilities are expected to make Filatex yarns available for such applications as suspenders, garters, elastic tapes and bindings, gloves, etc.

Develops New Bonding Process

Advance Rubber Co., Inc., Minneapolis, Minn., has developed a special process that bonds natural, synthetic or silicone rubber to metal. The new method allows parts with metal cores to be ground concentric to tolerances of ± .002. According to the company, this cannot be done with rubber alone. Nuts and bushings of rubber and metal can be tightened without breaking, where plastics or fibers would break or leave marks. Metal can now be used in many rubber items where rigidity as well as resiliency is required, Advance Rubber states.

Forms International Division

Arthur D. Little, Inc., Cambridge, Mass., has announced the establishment of an International Division to meet the increasing demand for its services in international areas. The new division, headed by A. G. Haldane, previously associated with the U. S. Department of Commerce, will offer company clients outside the United States the services of the firm as consultants for industrial development, engineering and economic problems.

Fox Joins Miller-Warden

Karl M. Fox

Karl M. Fox, well-known rubber technologist formerly associated with Rohm & Haas, Dewey & Almy and Goodyear, has joined the consulting firm of Miller-Warden Associates, 731 Yale Avenue, Swarthmore, Penna. In his new capacity, Mr. Fox will be in charge of rubber and plastics activities. This work involves surveying of markets, development of new products, and the evaluation of new uses for rubber and plastics. He also will supervise training of personnel in technical sales and service for Miller-Warden clients. A graduate of Miami University, Oxford, Ohio, Mr. Fox has contributed many articles to the technical literature.

Polyester Resin "Atlac LV"

A new sold polyester resin, "Atlac LV," is now available from the Atlas Powder Co., Wilmington, Del. After dissolving in styrene, the product possesses a viscosity in the low range required for application to glass fibers or other types of pre-forms by spraying, dipping or brushing. The characteristics of Atlac LV make it of special interest to fabricators of large items where low-temperature cure is normally used. Like other Atlac products, Atlac LV is supplied in the form of free-flowing granules. When using the product, sufficient resin for immediate use is easily made up by dissolving it in styrene, so that fresh resin is in use at all times, assuring uniform cure. The product possesses the added advantage of low exotherm with room temperature catalysts. Trial samples are available from the company.

Dewey & Almy Names Agent

Dewey & Almy Chemical Co., Cambridge, Mass., has appointed Martin, Hoyt and Milne, San Francisco, Calif., as exclusive sales representatives for its Organic Chemicals Division. The firm will handle sales of copolymer resins, polyvinyl acetate emulsions, copolymer latices, and plasticizers, most of which are now being produced in the company's new facilities at its Acton, Mass., plant. Widely known during their many years in business, Martin, Hoyt and Milne have offices in San Francisco, Los Angeles, Portland and Seattle.

NEW RUBBER PRODUCTS

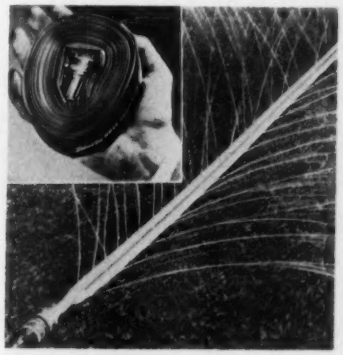
Squeezit Molasses Dispenser

Squeezit Corp., New York, N. Y., has introduced the new "Squeezit Lucky Elephant", a dispenser of molasses, honey and

syrups. Made of polyethylene, the squeeze-type product will not drip or ooze. It may be washed and stored in cabinet or refrigerator.

Andrews Plastic Lawn Sprinkler

Andrews Sprinklers, 6612 Sunset Blvd., Hollywood 28, Calif., has introduced a new, lightweight, plastic sprinkler which can spray an area more than 12 feet wide by 50 feet long at average water pressure. It can be draped over hillsides,



twined around flower beds, or shaped to any contour of the landscaping. When turned over it becomes a soaker. The hose is perforated with tiny holes which provide a gentle spray action. A 50-foot length weighs only 1 pound. It will not rot or mildew, even when stored wet. The hose comes equipped with a brass connector. According to the company, the new unit provides a spray so fine that it is even gentle on flowers.

"Neotex" Neoprene Rubber Mesh

Soft, neoprene rubber mesh which resembles expanded metal lath in appearance has been introduced by the Research Products Corp., Madison, Wisc. The material finds use as a lining for tote boxes and as a covering for work tables. It prevents delicate articles from being scratched or jarred during manufacture and assembly. The mesh is about 3/16 inch thick with 3/8 inch diamond shaped openings. It is made by applying a heavy jacket of neoprene to an expanded fiber core. The mesh is called "Neotex," and is identical to that made and marketed for the past few years to housewives for drainboards and china closets. Its successful use in manufacturing operations, however, led to its present introduction for manufacturing applications.

Miltron "Neo-Tron Rug"

Miltron Corp., Greenback, Tenn., has introduced the "Neo-Tron Rug," an all-purpose unit finding use anywhere in the home. The rug is made primarily from cotton laundry padding which has been coated with neoprene latex. In addition, it is

decorated with a neoprene-based paint to obtain a wide range of color combinations appropriate to any room in the house. The rugs are non-skid and can be cleaned with a damp cloth, soaps or detergents. "Neo-Tron Rugs" are available in three thicknesses in an 18 by 30-inch size.

Foam-Backed Auto Carpeting

A new foam rubber-backed carpeting, manufactured by the Collins & Aikman Corp., New York, N. Y., is now being used to cover automobile floors. The company claims that water will not penetrate it, dirt does not infiltrate it and vibration and sound are minimized. Secret of the carpet's effectiveness, the firm said, is that no adhesive is used to join the fabric to the foam rubber. Instead, a thick rubber "cream" is applied to the cloth, solidifying into a foam rubber pad that is an integral part of the carpet. General Motors Corp. has revealed that its 1953 Oldsmobiles and Cadillacs will sport the new cushioned carpeting.

Colored Rubber Butterflies

First pursued as a hobby, multi-colored rubber butterflies originated and produced by George H. Riddell, 2355 3rd St., Cuyahoga Falls, Ohio, are now finding acceptance for ornamental purposes such as clothes and hair ornaments, with corsages, on novelty flower pots, draperies, etc. Mr. Riddell makes his own molds from plaster

of paris, designs all the patterns, and compounds latex with various colors to produce the desired effects. The butterflies are washable and spring back into shape when rolled or crushed. In the manufacture of the product, the wings are molded separately from the body and then affixed to it; then pins, bobby pins or wires are added, depending upon the object's intended use. Many of the butterflies, extremely realistic and artistic in appearance with their quivery wings marked in colored dots and stripes, are mounted in neat

white plastic boxes with transparent covers. Now 67 years old, Mr. Riddell was formerly employed by the Vaughn Machinery Co. at Cuyahoga Falls. During this time, he worked at his hobby evenings and Sundays. Recently, however, he suffered a broken leg and, unable to work at the company, has been devoting his full time to the production of the rubber butterflies. The photographs herewith show a typical rubber butterfly and the manner in which they may be used.

Goodrich Chemical has issued Service Bulletin H-10, covering a "Comparative Evaluation of Hycar American Rubbers." Specifically, the bulletin covers Hycar nitrile rubbers 1011 and 1012, and the two polymers recently introduced for low-temperature applications, Hycar 1013 and 1014.

CANADIAN NEWS

The Canadian government has decided to take court action against rubber companies alleged to have participated in illegal price-fixing combines, according to a recent announcement. Warrants have been issued against the companies and the trials will likely take place in Toronto in the near future. Altogether, nineteen companies and the Rubber Association of Canada were named in a report made public last June, alleging the existence of six combines in the rubber industry. Not all of the companies may be prosecuted, however.

The inquiry, which began in September, 1947, covered six divisions of the industry: mechanical goods; tires and tubes; accessories and repair materials; heels and soles; footwear; and vulcanized rubber clothing. The following companies are named in the report with the categories of alleged violation indicated in parentheses:

Dominion Rubber Co., Ltd., Montreal, Kitchener, and St. Jerome, Que. (Mechanical goods, tires and tubes, footwear, accessories).

B. F. Goodrich Rubber Co. of Canada, Ltd., Kitchener. (Mechanical goods, tires and tubes, footwear, accessories).

Gutta Percha & Rubber, Ltd., Toronto. (Mechanical goods, tires and tubes, footwear, accessories).

Dunlop Tire & Rubber Goods Co., Toronto. (Mechanical goods, tires and tubes, accessories).

Goodyear Tire & Rubber Co. of Canada, Ltd., Quebec City, Bowmanville, and New Toronto. (Mechanical goods, tires and tubes, accessories).

Miner Rubber Co., Ltd., Granby, Que. (Footwear, heels and soles, clothing).

Barrington Rubber & Plastics, Ltd., Oakville, Ont. (Mechanical goods, clothing).

Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton. (Tires and tubes, accessories).

Seiberling Rubber Co. of Canada, Ltd., Toronto. (Tires and tubes, accessories).

Kaufman Rubber Co., Ltd., Kitchener. (Footwear, clothing).

G. L. Griffith and Sons, Ltd., Stratford. (Mechanical goods).

Viceroy Manufacturing Co., Ltd., Toronto. (Mechanical goods).

General Tire & Rubber Co. of Canada, Ltd., Toronto. (Tires and tubes).

Acton Rubber, Ltd., Acton Vale, Que. (Footwear).

Cambridge Rubber, Ltd., St. Remi de Napierville, Que. (Footwear).

Northern-Woodstock Rubber, Ltd., Toronto. (Footwear).

Panther Rubber Co., Ltd., Sherbrooke. (Heels and soles).

Holtite Rubber Co. of Canada, Ltd., Drummondville. (Heels and soles).

Canadian General-Tower, Ltd., Galt. (Clothing).

In addition, the Rubber Association is alleged to have been involved in five groups —all except mechanical goods.

According to recent reports, European interests have cooperated with the government of Newfoundland to bring a rubber goods plant to Newfoundland. To be located at Holyrood, 25 miles from St. John's, the plant will produce rubber overshoes, gaiters, suits, coats, gloves, etc. Cost of the plant will be approximately $2,000,000, of which half will be loaned the company by the government on a 10-year interest-bearing basis. Excavation of the site and construction of the plant was to have started before the end of this year. Production is expected to begin within the next half year with an initial working force of about 200, rising later to 400.

Harry D. Shipman has been appointed trade sales manager of the Firestone Tire & Rubber Co. of Canada, Ltd. With a background of seventeen years' experience in both passenger car and truck tire marketing and merchandising, Mr. Shipman was transferred to Firestone's Canadian organization earlier this year in the capacity of merchandise manager.

Giant earthmover tires for use in major construction projects are now being built by the Goodyear Tire & Rubber Co. of Canada, Ltd. These off-the-road tires cost up to $2,000 each, weigh close to 1,000 pounds, and stand five feet eight inches high. Each earthmover tire can carry a load of 17,630 pounds. It is a low-pressure tire carrying about 35 pounds of air.

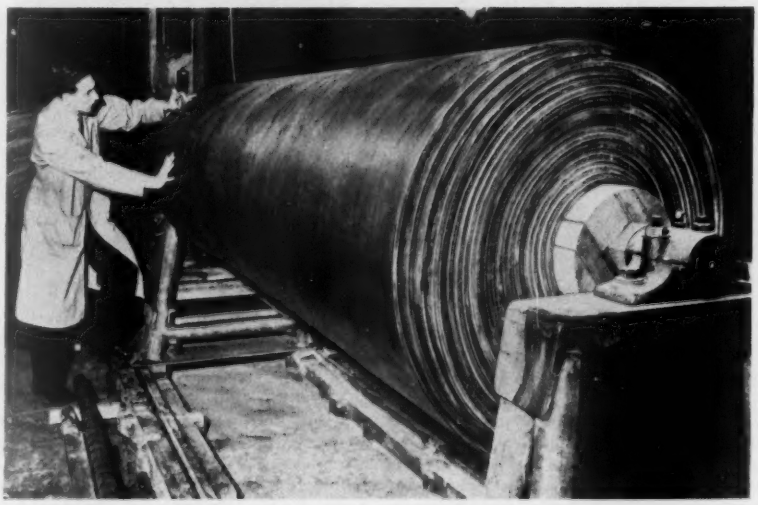
Product Reallocation Announced

A tentative reallocation of product responsibilities between the Control Department and the Industry Control Department of the General Electric Co., Schenectady, N. Y., was recently announced. Another step in the firm's over-all decentralization program, the split places together all products requiring similar marketing, manufacturing and engineering techniques. Control Department items will now include those turned out on a mass production basis. Included are most of the smaller control devices such as magnetic switches, solenoids, pushbuttons, general purpose A. C. contactors and relays, and small A. C. panels. Products of the Industry Control Department are, for the most part, fundamentally the control panels and equipment which require custom designing or high engineering content, such as low magnetic starters, motor control centers, rheostats and resistors, electronic controls and aircraft devices.

High Styrene Copolymer "43G"

The Organic Chemicals Division of the Dewey & Almy Co., Cambridge, Mass., has announced the production of "43G," a new high styrene copolymer. The product is intended for use primarily in soling, floor tile and wire and cable insulation. The new polymer is said to provide easier processing and harder stocks and imparts high abrasion resistance with greater flex life in both low and high gravity soling stocks. Another advantage of 43G is greater stability in the storage of uncured stocks.

GUTTA PERCHA PRODUCES ONE OF THE WIDEST CONVEYOR BELTS EVER MADE



Gutta Percha & Rubber, Ltd., Toronto, Ont., Canada, recently produced what is probably one of the widest conveyor belts ever manufactured. The belt is 115¾ inches wide. This belt is one of three being made for the Dominion Engineering Works, Ltd., for use in the sintering plant of the lead smelter of the Consolidated Mining and Smelting Co. of Canada, Ltd., Trail, B. C. Consolidated Mining's rubber shop will splice the belt in situ, using a vulcanized splice.

LEADING SUPPLIERS TO THE RUBBER, PLASTICS AND ALLIED INDUSTRIES ·

OBITUARIES

Karl W. V. Nix

Karl W. V. Nix, former crude rubber broker and well-known sales agent in the rubber manufacturing business, who was reported to have high business and political connections both here and abroad, shot himself to death in his luxurious home in Akron on November 16. Only 48 years of age, he was reputed to have gone through several fortunes and in the past ten years spent a good deal of time in the Far East.

Born in Butler, Missouri, Mr. Nix started his business career in the rubber industry with the Lee Tire & Rubber Co., leaving that company in 1927 to become a crude rubber broker in New York City. It was at this time that he began making trips to the rubber-producing areas in the Far East. In the 1929-30 period he served in the Far East for the General Tire & Rubber Co., but in late 1930 he returned to his crude rubber brokerage activities in New York. About 1936 he moved his activities to the Akron area.

From 1936 to 1940 Mr. Nix sold crude rubber in the Akron area, but at the outbreak of the war he became a self-styled textile executive, specializing for a time in the sale of tire cords and yarns. At the time of his death he was president of both the K.W.V. Nix Co. and the Fordmill Corporation, engaged in the converting and sale of industrial fabrics. For the past few years he was known to have made frequent trips to both Japan and Korea and, in fact, had recently built a home and opened an office in Tokyo.

Mr. Nix was reported to be on friendly terms with many Washington officials and to have had frequent visits with both Syngman Rhee, president of Korea, and Generalissimo Chiang Kai-shek, head of Nationalist China. He was also said to be on exceptionally friendly terms with officials close to General Douglas MacArthur. For a period of about six months in 1943 he served with the Crude Rubber Division of the Office of Economic Warfare, specializing in South American affairs.

Mr. Nix is believed to have suffered severe financial losses in recent months. Because of his international connections, his death is being investigated by the Federal Bureau of Investigation. Married several times, he is survived by his wife and an adopted son.

George R. Toney

George R. Toney, assistant to the president of the American Wringer Co., Woonsocket, R. I., passed away suddenly on September 22. Born on January 14, 1894, Mr. Toney served as a consultant to the Office of the Rubber Director, War Production Board, from 1941 to 1944. He also maintained a New York office from 1942 until the time of his death. He joined American Wringer in 1944.

Russell S. Roeller

Russell S. Roeller, general sales manager of the Pennsylvania Salt Manufacturing Co., died on November 12 at the Phoenixville, Penna., hospital. He was 60 years old. Mr. Roeller had recently been honored on the completion of 30 years service with the company. During most of his career, Mr. Roeller's chief interest was in developing markets for bulk or tonnage chemicals. He joined Pennsalt as a salesman in 1922 and advanced to the post of assistant sales manager in 1950. Shortly thereafter, he was named general sales manager. Long actve in chemical trade associations, Mr. Roeller was a member of the board of directors of the Chlorine Institute and of the Alkaline-Chlorine Committee of the National Production Authority. During World War II, he served as a member of the Army-Navy Munitions Board Advisory Committee. Funeral services were held on November 15 in Phoenixville with interment in Chelten Hills Abbey, Washington Lane, Philadelphia, Penn. His wife survives.

John M. Pearson

Dr. John M. Pearson, director of the physical laboratory for research and development of the Sun Oil Co., died on November 16 at his home in Swarthmore, Penna. He was 48 years old. Dr. Pearson joined Sun Oil in 1929 after attending Reed College in Portland, Ore., for two years and receiving a B.S. degree in chemistry in 1925 from the University of Chicago. He served for three years as an instructor at the California Institute of Technology, where he received his Ph.D. in 1930. Dr. Pearson held fifteen patents on electrical instruments for measurement and control. He also contributed to the technical literature. Dr. Pearson was a member of the American Petroleum Institute, the American Physical Society and past secretary of the Corrosion Division of the Electrochemical Society. He leaves his wife, a son and a daughter.

George S. Whitney

George S. Whitney, a notable figure in the invention and improvement of rubber machinery, died on November 20 at his home in Akron, Ohio. He was 86 years old and had been in failing health for the past few years. At one time some 20 years ago, Mr. Whitney was reputed to have built more rubber machinery than any other man in Akron. At that time he was an advisory engineer with the Adamson Machine Co., now the Adamson United Co., where he had been employed for 26 years, most of that time as superintendent. Mr. Whitney was born in Medina, Ohio, but had lived in Akron for 68 years. Services were held on November 22 in Akron. He is survived by his son.

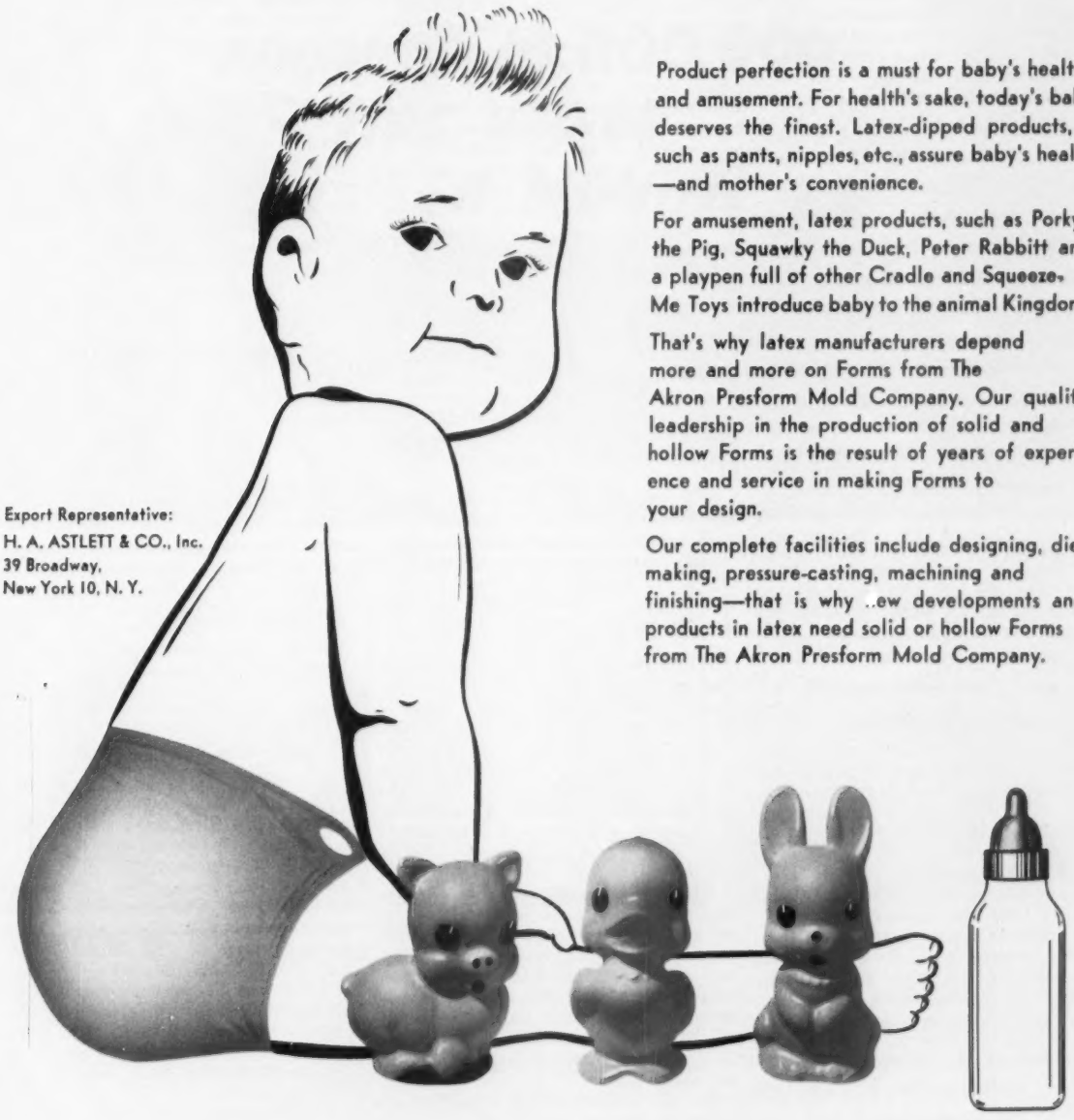
Vladimir N. Ipatieff

Vladimir Nikolaevich Ipatieff, world-famed chemist and teacher, died on November 29 in Chicago, Ill. He was 85 years old. In May, 1940, Dr. Ipatieff received the Willard Gibbs Medal for chemical discoveries basic to petroleum refining, and to the organic synthesis of synthetic rubber. Born in Moscow, he attended various military academies under the Czarist government. Russia, which eventually was to disown him, bestowed numerous honors on Dr. Ipatieff for research work that helped pave the way for the production of synthetic rubber and other products having a petroleum base. In 1914, Dr. Ipatieff was a lieutenant general in the Czar's army in charge of military chemical activities. He continued this work for a few years under the Communist regime, but in the late 1920's arranged to spend part of his time in the employ of a large German chemical company. He and his wife decided in 1930 not to return to Russia. In the same year, he joined the Universal Oil Products Co. in the United States. His work was a major factor in the petroleum industry's effort to make more and better fuel at lower cost from crude oil. The industry has given Dr. Ipatieff much of the credit for the production of high octane gasoline used in World War II. Becoming an American citizen in 1936, Dr. Ipatieff remained active almost to his death. His most recent program included three days a week in Universal Oil's research laboratory and two days instructing graduate students at the Technological Institute of Northwestern University. His wife, a son and a daughter survive.

Franklin T. Griffith

Franklin T. Griffith, chairman of the board and past-president of Griffith Rubber Mills, Portland, Ore., died at his home in Portland on November 7. He was 82 years old. Born in Minneapolis, Minn., in 1870, Mr. Griffith began his business career as a bookkeeper in California before moving to Oregon in 1891. Although he never attended a law school, Mr. Griffith passed the bar examinations in 1894, and became a prominent Oregon attorney, heading the firm of Griffith, Phillips and Coughlin. Through his law activities, Mr. Griffith became connected with the Portland General Electric Co., and in 1913 became its president. He was also president and later chairman of the board of the Portland Traction Co. He was also president of the Title & Trust Co. and the Firtex Insulated Board Co. Mr. Griffith became president and chairman of the board of Griffith Rubber Mills on the death of his brother, Charles R. Griffith, who founded the firm in 1910. In 1938, Mr. Griffith was named Portland's "Citizen of the Year" by the Portland Realty Club. He served as first president of the Portland Community Chest, and was active in the Shriner's Hospital for crippled children as well as many other civic projects. Mr. Griffith leaves his wife and two daughters. Zina A. Wise, his son-in-law, has served as president of Griffith Rubber Mills since 1951.

FORMS FOR TODAY'S BABY



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Product perfection is a must for baby's health and amusement. For health's sake, today's baby deserves the finest. Latex-dipped products, such as pants, nipples, etc., assure baby's health —and mother's convenience.

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Makers of Forms for latex-dipped items, such as—

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FORMS	MOLDS	DIES	MACHINERY
LATEX - DIPPING	STEEL AND ALUMINUM	PLASTIC - INJECTION	SPECIAL - AUTOMATIC

U. S. Royal Fleetway Tire

The U. S. Rubber Co. has introduced the "U. S. Royal Fleetway," a new truck tire. The new tire has been designed to reduce road failures and to give up to 41% more original tread miles than previously realized in tires sold at regular prices. Developed in U. S. Tire laboratories under four exclusive patented processes, the new tire is said to sharply reduce groove cracking. In this process, the new tire is exposed to intense and penetrating infra-red rays to toughen the grooves. The "Micro-Mix Tread" is compounded in a new hot process that homogenizes all elements of the tread in perfect dispersion. Rayon cords are solutioned in a special plastic resin to insure that the rubber coating will bond permanently to the cords and insulate them to prevent chafing each other. A newly developed chemical has been used in the sidewall compound to guard against weather checking. Other features of the new tire are a wider center rib with narrow outer ribs, heat resistant vulcanized shoulders, and a five-row rib design up to and including 10-inch cross section. Above this size a seven-row design is used. Double shock pads impregnated with tread rubber are bonded permanently to the carcass by thousands of tiny rubber "rivets" to prevent tread separation. Steel bead wires in the Fleetway are bronze plated to prevent corrosion before being insulated with rubber. The new tires are designed with a flatter road level profile to put more working rubber on the road, and they are interchangeable for all truck or trailer wheels, single or dual.

Aaron C. Horn

Aaron Charles Horn, chairman of the Executive Committee and a director of the Sun Chemical Corp. of Long Island City, N. Y., died recently at his home in New York City. He was 76 years old. Born in New York City, Mr. Horn worked his way up from laborer in a paint factory at the age of thirteen, to directorship in at least ten industrial establishments. Mr. Horn organized the A. C. Horn Co., Inc., in 1899, specializing in the manufacture of waterproofing materials. In 1945, this company was acquired by the Sun Chemical Corp. and became a division of that firm. Among the firms in which he held directorships was the Warwick Wax Co.

Ivan Sorvall

Ivan Sorvall, president of the company bearing his name in New York City, died of a heart attack on November 8 near his home in Massapequa, L. I., N. Y. He was 55 years old. Born in Stockholm, Sweden, Mr. Sorvall completed his education and commercial training before he came to the United States. In 1922 he started in business as an importer of Swedish merchandise. Later, he organized Ivan Sorvall, Inc., manufacturing laboratory equipment. He also was president of Odhner Sales, Inc., New York, N. Y., which introduced to the American market the Swedish Odhner adding machine.

LOS ANGELES NEWS

With more than 300 industrial and civic leaders in attendance, the W. J. Voit Rubber Corp. officially opened its new camelback and tire repair materials manufacturing plant in Portland, Ore., on October 25. The plant, a 16,000 square foot building, is located on a three and one-half acre site which provides ample room for expansion. Approximately 40 workers will be employed at the new plant which is capable of producing 500,000 pounds of materials per month. Voit Rubber has already invested approximately $500,000 in real estate, buildings and equipment, including three 60-inch rubber mills, one 8-inch extruder and auxiliary equipment.

Golden State Rubber & Latex Corp. has announced the transfer of its general offices and factory to 1538 West 132nd St., Gardena, Calif. A new 7,500-foot building is located on nearly half an acre of ground with over 10,000 square feet of additional area for expansion, storage, parking, assembly and application work.

Dave Adams has formed the Adams Rubber Co. at 5969 S. St. Andrews Place in Los Angeles, specializing in custom calendering and the bonding of rubber to metal. His son, Walter Adams, is serving as factory superintendent. The firm now employs six persons.

The November 5th meeting of the Los Angeles Rubber Group held at the Hotel Statler in Los Angeles, Calif., attracted over 300 members and their guests. The meeting was sponsored by the Goodyear Tire & Rubber Co. The dinner meeting was addressed by Jess Hill, head coach and athletic director of the University of Southern California. Some excellent films were shown of the recent Olympic Games at Helsinki.

The technical session of the meeting was addressed by Dr. B. S. Garvey, Jr., director of the Rubber Sales Service Laboratory of Sharples Chemicals Inc. Dr. Garvey spoke on "Accelerator Compounding." Dr. Garvey discussed scorch time, cure time and vulcanization time as important phases of accelerator compounding. He also compared three methods of measuring scorch time.

He also pointed out the significant relationship between scorch time, cure time and vulcanization time. He also discussed the significance of heat history, as measured by time on a hot mill, to both scorch time and cure time.

Harvey H. Morrison has joined the Stillman Rubber Co., Culver City, Calif., as vice-president in charge of production. He was formerly vice-president in charge of production for the Los Angeles Standard Rubber Co.

Process Industries Engineers, Inc., Pittsburgh, Penna., has appointed Bullock-Smith Associates, New York, N. Y., as sales representatives in greater New York, northern New Jersey and Connecticut.

New Vinyl-Type Paint Vehicle

Reichhold Chemicals, Inc., New York, N. Y., has announced that it has begun production of a vinyl-type, latex emulsion synthetic resin vehicle known as "Wallpol" for making odorless, rubber-base, flat wall finishes. Although this marks the company's debut in the vinyl field in America, similar vinyl-type emulsions have been made for almost a decade by Vinyl Products, Ltd., and Vinatex, Ltd., both of London, affiliates of Reichhold Chemicals, Ltd., England. The new vinyl-type resin has been introduced in the United States to complement an alkyd-type latex emulsion resin called "Wallkyd" which was introduced by Reichhold earlier this year. Paint formulators in the Chicago area are now being serviced by Reichhold representatives and technicians working out of the company's mid-west division plant at Argo, Ill., it was reported.

Israeli Plant in Operation

The first major tire plant in the Middle East, an affiliate of the General Tire & Rubber Co., is now in full operation near Tel Aviv in Israel. A minority stockholder in the enterprise, General Tire supplies the plant management and technical know-how. Harold W. Purviance of General Tire's foreign staff is general manager. Construction work on the plant started last year. American-made equipment and machinery were shipped to Israel for installation in the factory. Plant facilities cover 90,000 square feet of floor space. It is geared for an annual production capacity of 100,000 tires and tubes. All products will carry the General Tire trademark.

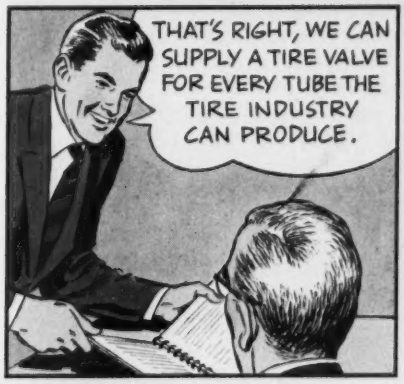
Circle Wire Common Stock Sale

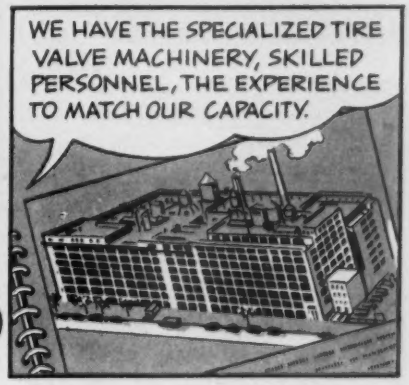
Two executives of the Circle Wire & Cable Corp., Maspeth, L. I., N. Y., plan to sell 50,000 shares apiece of their holdings in the company's common stock. Circle Wire, in a statement at the Securities and Exchange Commission in Washington, D. C., said that Van Alstyne, Noel & Co. and Hornblower & Weeks would underwrite the issue for Sol Cohn, president, and Max B. Cohn, executive vice-president and secretary. The two now own a total of about 307,000 shares—or 41% of the firm's outstanding common stock. At the current market price the 100,000 share offering would have a gross value of more than $2,100,000.

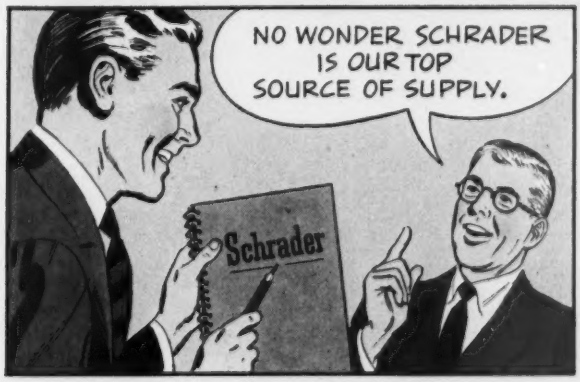
Builds New Plastics Laboratory

The International Shoe Co. has established a plastics laboratory adjacent to its tanneries at Hartford, Ill. The new laboratory was scheduled to begin operations by the end of this year. The laboratory will consist of three sections: chemistry, synthesis and fabrication, and is part of an expansion program which will include a new division devoted to product and process development. About the middle of October, International Shoe obtained a long-term private loan of $30,000,000 to finance the expansion. Included in the plans is the construction of a processing plant at Bryan, Texas, for the manufacture of heeling and soling materials.

Schrader Contributions to the Tire Industry







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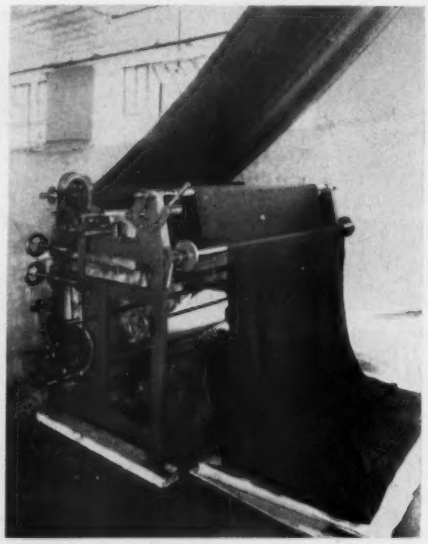
NEW EQUIPMENT

Mawaco Rubberizing Machine

Rubberizing units made by the Mawaco Machine Co., 56 Bogart St., Brooklyn 6, N. Y., are being widely used for the application of rubber or latex compounds to the back of fabrics, particularly in the cotton rug field where units are being used for processing cotton rugs up to 12 feet in width. The Mawaco units apply rubber to the



fabric from underneath rather than feeding compounds from a trough above the fabric. According to the manufacturers, this system offers three specific advantages: (1) The amount of rubber to be applied can be regulated accurately; (2) There is no danger of compound seeping through the fabric and causing damage to the finish, and (3) The machine can be stopped at any time during the operation without danger of the rubber overflowing.

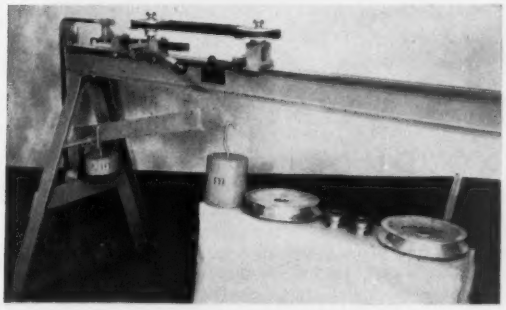
The Mawaco Rubberizing Machine has a welded steel frame and steel traverses. The cloth enters the machine face up, over adjustable tension bars and adjustable idler rollers, and then over the compound application roller. The latter is made of steel tubing completely covered with hard rubber and runs in a shallow, stainless steel trough underneath. This roller, revolving in the trough, picks up the rubber compound and applies it to the fabric, the correct amount being regulated by a finely adjustable doctor blade. From that point the cloth runs again over an idler roller and on to the delivery rollers. A second adjustable doctor blade or scraper, working directly on the back of the fabric, insures even distribution of the compound and at the same time presses the compound into the weave.

The speed of the compound application roller can be varied by a quick change gear on the drive unit, a feature furnishing an additional means of accurately gauging the amount of rubber to be applied to the cloth. If required, the machine can be furnished with a rotary brush and beater attachment for cleaning the back of the fabric of flock and loose threads. The machine, which in most

cases is set in front of the dryer and is driven from the dryer by sprockets and chain, has a built-in 1½ h.p. motor with vari-speed drive. It weighs approximately 1400 pounds and occupies 4 x 7½ feet in floor space. The production rate of the machine is generally determined by the capacity of the dryer to properly cure the rubber.

Flexoid V-Belt Matching Machine

Three new models of the Flexoid V-Belt Matching Machine, which measure length of V-belts under tension equivalent to operating conditions, have been introduced by the Smith Power Transmission Co., 1545 East 23rd St., Cleveland 14, Ohio. Model A matches V-belts up to 540 inches in length, Model B up to 360 inches, and Model C up to 240 inches. Model B is illustrated herewith. In addition to measuring the length of belts under tension equivalent to that developed in the belt under



drive conditions, thus giving an accurate measurement, the Flexoid units may also be used to determine the exact pitch length of the belts. This is reported to be extremely helpful on belts used on a fixed center drive and in identifying the length of belts when the belt number has been obliterated. The Flexoid units vary in over-all length from 11 feet, 3 inches to 25 feet, 6 inches, and in shipping weights from 120 to 605 pounds.

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G-E Improved Hysteresis Brake

An improved hysteresis brake that holds constant tension on yarn, wire, etc., by magnetic drag instead of friction has been announced by the Control Department of the General Electric Company, Schenectady, N. Y. The brake consists of Alnico magnets so designed and mounted that a magnetic drag (or hysteresis effect) offers a restraining force on a pulley. This force is essentially constant at all speeds and can be adjusted simply by turning the calibrated head mounted above the pulley. The restraining force of the magnets assures minimum abrasion on the yarn since the material is always in contact with the revolving pulley and is not rubbed or drawn over the surface.

According to G-E engineers, the new brake reverses the direction of rotation a few degrees after stopping, thereby holding stalled tension. The inertia of the brake itself is slight enough that yarn does not become unthreaded during quick acceleration and deceleration. The construction of the brake permits operational speeds up to 700 yards per minute while tension control ranges from 3.5 to 10.5 grams. Applications for the device include tension control for synthetic and natural yarns as well as rubber, glass-fiber, and small diameter wire.

Globe Laboratories De-Stat Cloth

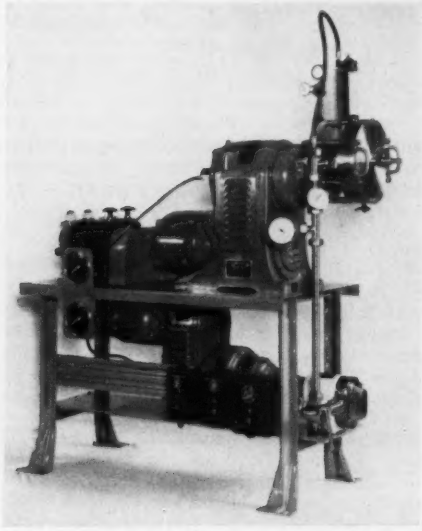
De-Stat Cloth, a new product designed to solve the problem of static electricity inherent in many industrial products, has been developed by the Globe Laboratories of Sherman Oaks, California. With a simple wipe the new cloth is said to remove all static charges and prevent their recurrence on such materials as natural and synthetic rubbers, plastics, and plastic-base and rubber-base paints. According to the company, De-Stat Cloth has been rigorously tested on vinyl chloride, polystyrene, acrylic, and other types of plastics, with excellent results. Measuring 18 inches square, the cloth is thoroughly impregnated with a special chemical compound and, if kept free from dirt, can be used indefinitely. The company is also producing the cloth in 36-inch wide pile fabric yardage for use on rollers in manufacturing where the material is rolled in a continuous process and destaticizing can be done simultaneously. All materials that have been wiped with De-Stat Cloth can be washed with soap or chemical detergents without losing their anti-static qualities. The cloth is said to be non-toxic and will not harm human skin.

A new idea in heat measurement is said to be available in the **Dillon Handle Type Thermometer** recently made available by W. C. Dillon & Co., Van Nuys, Calif. Provided with a comfortable handle grip on opposite sides of the dial, the thermometer can be plunged directly into hot asphalt, foundry sand, chemical mixtures, etc., without burning the operator.

Lydon Brothers, Inc., Hackensack, N. J., have developed a new **electrically-heated drawer-loading oven** especially designed for use in sintering fluorcarbons, such as Teflon, at temperatures to 750° F. Features include an internal air circulation system, insulated fronts on the drawers, and an excess temperature cut-out.

Smaller Capacity Oakes Mixer

A smaller model of the Oakes Continuous Automatic Mixer has been introduced by the E. T. Oakes Corporation of Islip, L. I., N. Y. Called the Model 10M-3 Mixer, the unit is reported to have half the capacity of the standard Model 14M-5. According to the company, the new



unit has already received acceptance in operations where large throughput is not required. It finds application not only in the food and related industries, but in the latex foam sponge and chemical processing industries.

Valvair Solenoid Pilot Valve

A new solenoid pilot valve is currently being offered by the Valvair Corporation, 966 Beardsley Ave., Akron 11, Ohio. Measuring 3 inches in height, the valve handles air, vacuum, oil, water and inert gases. The body and cover are of high tensile zinc base alloy. The standard coil is adaptable to either continuous or intermittent service. The coil is completely sealed from but is cooled by the fluid or air passing through the valve. There are only two moving parts—plunger and stem. The stem is one-piece and unbreakable. Sealing is by Hycar O-rings which will deteriorate from age only. The valve can be drilled through the bottom for manifold mounting to order or can be furnished by Valvair's design. Models include 2-way and 3-way either normally open or normally closed. Various orifice sizes are available, ranging from 1/16th of an inch to ¼-inch.

The line of Crescent valves distributed by Barksdale Valves, 1566 East Slauson Ave., Los Angeles 11, Calif., has been augmented by a new **three-way solenoid-controlled and pilot-operated valve.** Known as Model 1034, the new valve is designed to control any light fluid medium, such as air, water and light oils, and the design provides a pressure range of from 20 to 500 psi for either normally open or normally closed service.

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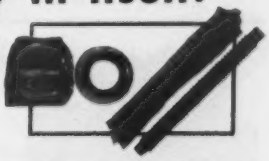

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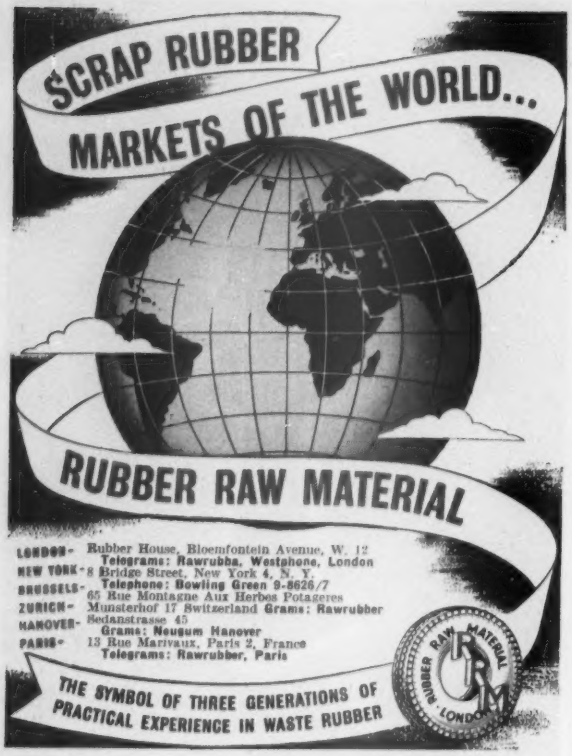
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REVIEWS

BOOKS

Colloid Science. Vol. I—Irreversible Systems. Edited by H. R. Kruyt. Published by Elsevier Publishing Co. Distributed by Elsevier Press, 402 Lovett Boulevard, Houston, Texas. 6½ x 10 in. 390 pp. $11.00.

Shortly after the outbreak of World War II, Dr. Kruyt, well-known Dutch physicist, together with several of his colleagues, discussed the need for a collective work on the science of colloids with the current publishers. Actual work on the preparation of such a work was started shortly thereafter and it was decided to issue it in two volumes, one covering reversible and the other irreversible systems. By chance, the second volume, covering reversible systems, appeared first (*Rubber Age,* Page 340, December, 1949). The issuance of Volume I, covering irreversible systems, completes the work.

Contributors to the current volume, in addition to Dr. Kruyt himself, include G. H. Jonker and J. Th. G. Overbeek. There are nine chapters in all, as follows: (1) General Introduction; (2) Phenomenology of Lyophobic Systems; (3) Optical Properties of Colloidal Solutions; (4) Electrochemistry of the Double Layer; (5) Electrokinetic Phenomena; (6) The Interaction Between Colloidal Particles; (7) Kinetics of Flocculation; (8) Stability of Hydrophobic Colloids and Emulsions; (9) Rheology of Lyophobic Systems. There are also author and subject indexes.

As the editor indicates in his preface, the work has no pretension of being a complete treatise. It is meant only to be a guide to the domain of colloid science. The division of the treatment is made throughout according to general phenomena, with the examples taken each time for those systems in which the phenomenon is shown most characteristically or has been studied most satisfactorily.

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Fundamental Principles of Polymerization: Rubbers, Plastics and Fibers. By G. F. D'Alelio. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 6 x 9¼ in. 518 pp. $10.00.

Numerous publications have appeared in recent years on the subject of polymerization, but most of these books treat with the technology of applied polymerization, namely, the field of plastics. The current book, which deals with the fundamental principles of polymerization, is thus a most welcome addition to the technical literature. It is not encyclopedic in scope, as the author points out in his preface, but it does summarize the minimum fundamental knowledge that a scientist in the field of polymerization requires.

The book is divided into 10 chapters. It begins with a discussion of the gaseous, liquid, and solid states of matter and then classifies polymers according to the rubber, the plastic, and the fiber states. Polymerization reactions and functionality are then discussed, followed by a critical analysis of the "existence" of macromolecules. The non-homogeneity of polymers and their properties are next treated with and important intermolecular and intramolecular reactions then summarized. This is followed by details on the polymerization processes and an outline of the basic ones. The last four chapters deal in turn with molecular weight determinations, the kinetics of polymerization, reaction loci in polymerization systems, and copolymer compositions and the stability of polymers.

Dr. D'Alelio, the author, who previously authored "Experimental Plastics and Synthetic Resins," is well qualified to have written the current work. As vice-president and manager of research of the Koppers Co., Inc., he has been close to polymerization problems in all of their ramifications for many years.

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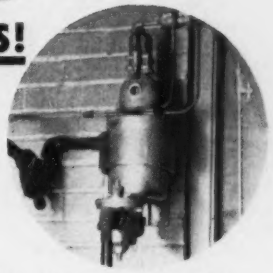

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REVIEWS (CONT'D)

Natural Rubber Latex and Its Applications: I—An Introduction to Its Origin, Properties and Manufacture. By Henry P. Stevens. Published by the British Rubber Development Board, Market Buildings, Mark Lane, London, E.C. 3, England. Available from Natural Rubber Bureau, 1631 K St., N.W., Washington 6, D. C. 5½ x 8½ in. 72 pp.

Volumes on latex, in one form or another, have been issued from time to time by the British Rubber Development Board or its predecessor organizations since 1928, the last edition having been published in 1948. Based on the advances made in recent years in both the theoretical and practical fields, it was realized that a new revision was required. It was found, however, that so many changes were called for in the text that a complete rewriting was necessary and, further, that so many new applications have been developed that it was impractical to combine all of them adequately in one volume. Accordingly, the Board has decided to issue a series of books on latex, of which the current volume is the first. Subsequent volumes will cover specialized applications.

As indicated by its title, the current work is devoted to the origin, properties and manufacture of latex. It is divided into seven chapters, as follows: (1) Botanical Sources; (2) Constituents of Latex and Their Effects; (3) Properties and Testing; (4) Concentration; (5) Applications of Latex: Production of Rubber Goods; (6) Patents; (7) Bibliography. The chapter on "Patents" includes a list of short abstracts from British patents while that on "Bibliography" contains a short list of books and periodicals devoted to latex. There is also a subject index.

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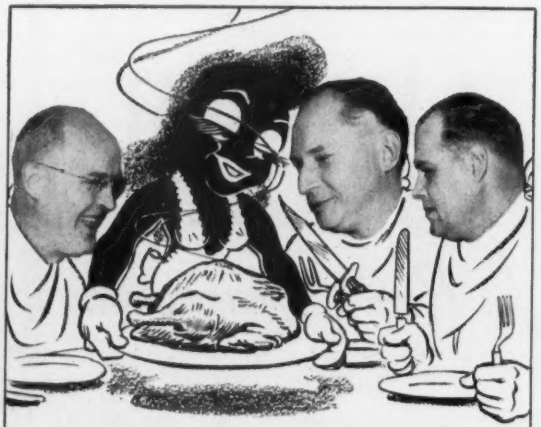
Encyclopedia of Surface-Active Agents. By J. P. Sisley. Translated and revised by P. J. Wood. Published by Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N. Y. 6 x 9 in. 540 pp. $15.00.

This is a combination text book and directory. It is divided into two parts, the first dealing in text book form with the general aspects of surface-active agents, their properties, applications and methods of manufacture, and the second consisting of an alphabetical listing of brand-name surface-active agents manufactured all over the world. Among the chemicals covered in the first part are wetting agents, detergents, penetrants, foaming compounds, emulsifiers and dispersing agents. Their many applications in numerous industries, including the rubber industry, are discussed. An efficient system of classifications by which every variety of the modern surface-active agents can be identified by simple symbols is included.



Merry Christmas!
SEE PAGE 292

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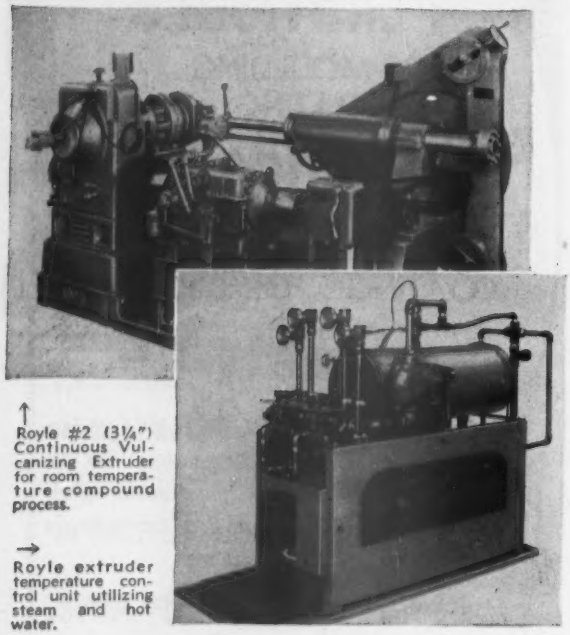
To the Wire Insulating Industry

The room temperature compound process and associated equipment recently developed by the Western Electric Company, Incorporated, offer nine important advantages. These advantages begin with the storage of completely mixed, ready-to-extrude, rubber, GR-S, or Neoprene compounds and extend to a smoother and improved appearance for the finished product.

The complete extruder vulcanizing portion of the room temperature compound process is available to insulated wire producers* from John Royle and Sons who, for seventy-two years, have been building extruding machines to meet the most exacting process requirements.



↑ Royle #2 (3¼") Continuous Vulcanizing Extruder for room temperature compound process.

→ Royle extruder temperature control unit utilizing steam and hot water.

CHECK THESE ADVANTAGES:

- Improved diameter control
- Reduction in compound scrap
- Reduction in electrical faults
- Permits storage of completely mixed compounds
- Permits more economical scheduling of mixing equipment
- Eliminates "warm-up" operation
- Possible mill-room economies
- "Hot" machines may be converted
- Finished product has smoother finish—better appearance

Licensees of Western Electric Company

JOHN ROYLE & SONS
10 ESSEX STREET, PATERSON 3, NEW JERSEY

BOOKLETS, CATALOGS, etc.

Adjustable Voltage DC Drives for Rubber and Plastics Manufacturing Plants. (GER-655). By I. E. Andreasen. Industrial Engineering Department, General Electric Co., Schenectady, N. Y. 8½ x 11 in. 8 pp.

This bulletin originally appeared as an article in the July-August, 1952, issue of *Industrial Engineering News*. It compares adjustable voltage DC drives with the constant potential DC bus system. The comparison includes equipment costs, installation costs, floor space requirements, maintenance, and the operating performance, reliability, flexibility and efficiency of both systems. It concludes that the better performance and lower cost of adjustable voltage drives makes them the logical choice for rubber and plastic processing machines which require adjustable speed operation. It also states that as existing potential conversion units are retired they should be replaced with adjustable voltage conversion units.

•

Electronik Recorders-Indicators. (Catalog 1520). Industrial Division, Minneapolis-Honeywell Regulator Co., Wayne and Windram Ave., Philadelphia 44, Penna. 8½ x 11 in. 48 pp.

This catalog contains factual information concerning "Electronik" non-control precision instruments, which employ a potentiometer, Wheatstone bridge, or other measuring circuit to measure temperature, pressure, flow, pH and a host of other variables. Actually a handbook for the use of engineers and buyers, this catalog presents detailed specifications for each particular model. Also included is information on specially adapted Electronik instruments, such as the "Electrometer", "Function Plotter", "Scanning System", "TV Dial Recorder", "Double Range Precision Indicator", and "Console Desk Precision Indicator".

•

1953 Guide to Improved Packaging with Bakelite and Vinylite Plastics and Resins. Bakelite Co., 30 East 42nd St., New York 17, N. Y. 8½ x 11 in. 12 pp.

Latest developments in packaging protection, economy and sales appeal for a wide variety of products are presented in this booklet. More than 60 photographs illustrate packaging applications of Vinylite, and Bakelite polyethylene, styrene and phenolic resins and plastics. The properties, advantages, packaging applications and fabricating methods for the various forms of Bakelite and Vinylite plastics and resins are clearly set forth under six headings. Coatings, Molded and Blown Plastics, Sheet Materials, Film and Sheeting, Packing Materials, and Adhesives.

•

Tygon Corrosion-Resistant Linings. (Bulletin TL-526). Process Equipment Division, U. S. Stoneware Co., Akron 9, Ohio. 8½ x 11 in. 12 pp.

The complete history of "Tygon" as a lining and covering material is presented in this illustrated bulletin. The composition of the material is discussed as are its physical forms and properties. Extensive tables give a thorough picture of the material's chemical resistance. Comparisons with various types of lining materials are made. Methods of preparation, application, maintenance and repair of mechanical damages are also presented.

•

Physical Properties of Synthetic Organic Chemicals. (1953 Edition). Carbide and Carbon Chemicals Co., 30 East 42nd St., New York 17, N. Y. 8½ x 11 in. 20 pp.

The synthetic organic chemicals offered by the company are here described as to their physical properties. Some 56 new chemicals now being offered by the company are also discussed as are the production and research facilities of the company, and its facilities for special work and distribution. A handy index to all the products discussed is provided.

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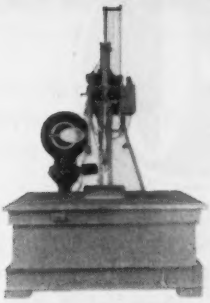
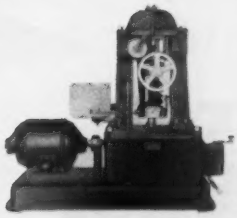


MODEL RMA

Cushion Tester, evaluates the compression characteristics of cushions, mattresses and slabs of foamed sponge rubber.



MODEL R

Compression-cutting Tester, determines the compression resistance of the rubber covering on insulated wire, as well as rubber and elastomers in other forms.

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•

Natural Rubber

•

Plastic Scrap

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REVIEWS (CONT'D)

Treatment of Cellulose and Cellulose Derivatives with Peroxygen Compounds. (Bulletin No. 43). Buffalo Electro-Chemical Co., Inc., Station B, Buffalo 7, N. Y. 8½ x 11 in. 11 pp.

Peroxygen compounds, notably hydrogen peroxide, are widely used in treating cellulose, cellulose derivatives and cellulosic materials. It is the purpose of this bulletin to picture the role played by peroxygen compounds in processes of this type. Various examples of uses to which these compounds are applied can be further explained by relating to the convenient literature references listed as an appendix to the bulletin.

•

Instrumentation, Tools, and Accessories for Olsen Universal Testing Machines. (Bulletin No. 46). Tinius Olsen Testing Machine Co., Easton Rd., Willow Grove, Penna. 8½ x 11 in. 24 pp.

Detailed information on instrumentation, tools and accessories for Universal testing machines is given in this catalog. Electronic recorders, electronic strain instrumentation, mechanical extensometers, tension compression, wood and plastics testing tools, and control accessories are a few of the topics covered. The catalog is illustrated with photographs.

•

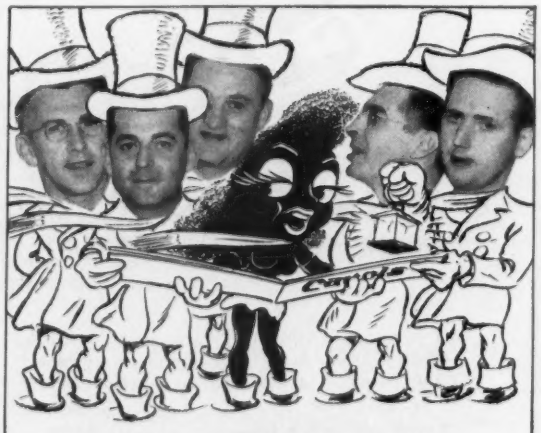
Comparative Evaluation of Hycar American Rubbers. (Service Bulletin H-10). B. F. Goodrich Chemical Co., Rose Bldg., Cleveland 15, Ohio. 8½ x 11 in. 8 pp.

This bulletin presents a discussion of two well-known Hycar nitrile rubbers—1011 and 1012—and two polymers—1013 and 1014—recently introduced for low-temperature applications. Two recipes were used and each polymer was compounded in both and the data compared. The data clearly present the effect of the acrylonitrile content on the physical and immersion properties and label each polymer with its place in the Hycar line.

•

New Simplified "50" Series Measuray. (Catalog MY-52-3). Measuray Sales Division, Sheffield Corp., Dayton 1, Ohio. 8½ x 11 in. 16 pp.

This catalog describes and illustrates the new simplified and compact "50" series of the Sheffield Measuray. The unit is described as a non-contact X-ray gage for continuous or intermittent measurement of strip or sheet stock while in motion or stationary. Many of the component parts of the unit are described, while the various models and their capacity ranges are listed.



Merry Christmas!

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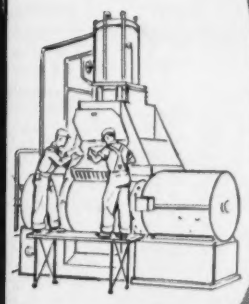

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MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, DEC. 5, 1952

Natural Rubber

The price of spot rubber on the New York Commodity Exchange has swung in a range of 3.75c since our last report (November 6), high for the period being 31.75c reached on December 5, and low being 28.00c reached on November 7. The average price of spot rubber for the month of November was 29.14 based on 17 trading days. This compares with an average of 27.06 in October.

In view of the enormous consumption of new rubber by the United States, it is expected that a relatively good demand for natural will hold for the next few months, regardless of the price. Manufacturers may, however, permit their stocks to decline.

Trade sources indicate that a new record high consumption may be in prospect for 1953. Leaders in the industry are speaking of natural rubber consumption in the United States for next year reaching 540,000 tons, about 90,000 more than this year.

Today's quotations on the outside market, London and Singapore, follow:

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.31¼
December	.31¼
January	.31½
Thin Latex Crepe:	
Spot	.40
Thin Brown Crepe, No. 2	.28¼
Smoked Blankets	.28½
Flat Bark Crepe	.26½

London Market
(Standard Smoked Sheets)

January-March	32.08 - 32.37
April-June	30.92 - 31.21

Singapore Market
(Standard Smoked Sheets)

January	30.55 - 30.62

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM NOVEMBER 7 TO DECEMBER 5

Nov.	Spot	Dec.	Mar.	May	July	Sales
7	28.00	28.50	26.80	26.15	25.65	68
8	——	——	——	——	——	——
9	——	——	——	——	——	——
10	28.50	29.20	27.20	26.45	25.80	64
11	——	——	——	——	——	——
12	28.50	29.50	27.50	26.50	25.85	166
13	29.00	29.50	27.30	26.30	25.75	84
14	29.38	29.80	27.85	27.15	26.75	171
15	——	——	——	——	——	——
16	——	——	——	——	——	——
17	29.58	30.00	28.10	27.15	26.75	37
18	30.00	29.25	28.85	28.15	27.60	64
19	29.75	29.50	28.50	27.75	27.15	46
20	29.75	29.50	28.60	27.75	27.25	50
21	29.50	29.50	28.50	27.70	27.20	56
22	——	——	——	——	——	——
23	——	——	——	——	——	——
24	30.50	30.40	29.40	28.75	28.05	112
25	30.50	31.10	29.90	29.00	28.45	115
26	30.25	30.50	29.40	28.45	27.90	72
27	——	——	——	——	——	——
28	31.00	31.25	30.25	29.25	28.70	119
29	——	——	——	——	——	——
30	——	——	——	——	——	——
Dec.						
1	30.75	31.25	30.05	29.05	28.40	60
2	30.25	30.25	30.00	29.02	28.50	90
3	30.25	31.10	30.84	29.90	29.35	77
4	31.25	31.10	30.80	29.80	29.25	52
5	31.75	31.55	31.25	30.30	29.70	106

Scrap Rubber

It has been reported that tires are plentiful at prices considerably below official OPS ceilings. Some small shortage still exists for specialty items and some tubes. The market has made some slight improvement although prices are still pegged at a level less than that established by the government. OPS prices are shown below:

(Prices Delivered Akron)

Mixed tires	ton	$26.00
Mixed beadless tires	ton	34.00
Light colored carcass	ton	130.00
Black carcass	ton	50.00
No. 1 peelings	ton	65.00
No. 2 peelings	ton	42.00
No. 3 peelings	ton	38.00
Buffings	ton	30.00
Truck and Bus S.A.G.	ton	28.00
Passenger S.A.G.	ton	28.00
Mixed S.A.G.	ton	26.00
Light colored tubes	lb.	.16
Natural rubber red tubes	lb.	.16
Natural rubber black tubes	lb.	.11½
Mixed natural rubber tubes	lb.	.10
Butyl rubber tubes	lb.	.057
GR-S rubber tubes	lb.	.02
Mixed synthetic tubes	lb.	.03

Reclaimed Rubber

Reclaim demands are reported as keeping up, with November shipments almost equal to October. Reclaimers are reported to have large inventories, but are buying their current needs rather than using the material on hand. As is the usual case, most of the demand for reclaim is coming from the automotive field. Prices as established by the Office of Price Stabilization follow:

(Prices for All Areas Except Calif.)

Premium Grade Whole Tire	.10½
First Line Whole Tire	.10
Second Line Whole Tire	.09½
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.08¾
Black Carcass	.14½
No. 1 Light Colored Carcass	.20¾
No. 1 Select Peel	.11¾
No. 1 Peel	.10½
Butyl Tube Reclaim	.14½
S.P. Natural Rubber Black Tube	.21
Natural Rubber Black Tube	.20
Natural Rubber Red Tube	.24¼
Natural Rubber Gray Tube	.24¼

Cotton Tire Fabrics

The trade has reported a quickening in the market for chafers while the market for cotton tire cord remains at the low levels evidenced for the past few months. It is expected that the market for chafers will hold for the foreseeable future, although not too much is expected for cotton tire cord. Prices have been reduced somewhat to more closely reflect current conditions:

Standard, Peeler, 12/4/2	lb.	.85
Extra Staple, Peeler, 12/4/2	lb.	.91

Chafers

14.4 oz. (per square yard)	lb.	.77
9.25 oz. (per sq. yard)	lb.	.73
11.65 oz. (per sq. yard)	lb.	.72
8.9 oz. (per sq. yard)	lb.	.73½

Cotton

Since our last report (November 6), the price of middling uplands on the New York Cotton Exchange has moved in a range of 2.45c, high for the period being 36.60c reached on November 7, and low being 34.15c reached on December 5. The average price of middling uplands for the month of November was 35.59c based on 17 trading days. This compares with an average of 37.52c in October.

The *Daily News Record* cotton report shows a total crop this year of 14,864,000 bales, compared with 14,905,000 indicated by the government report on November 1. Exports of cotton so far this year total 895,675 bales, contrasted with the 1,899,474 exported by this time last year.

Consumption of raw cotton in West Germany, which declined to a 1951-52 season low of 63,000 bales of 500 pounds gross in June, 1952, has increased. Consumption in July, last month for which official figures are available, shows that 74,000 bales were used. It is estimated in the trade that 85,000 bales will be consumed in September. 1951-52 consumption totaled 910,900 bales, 135,000 bales less than in the 1950-51 season.

The Steering Committee of the Beltwide Cotton Producers Committee has suggested a voluntary reduction of cotton acreage in 1953 to bring production next year into line with anticipated demands. Agriculture Secretary Charles F. Brannan said some time ago that cotton acreage curbs and marketing quotas would not be imposed by the government in 1953. The Steering Committee, however, is reported to be thinking ahead to 1954.

Quotations for middling uplands on the Exchange follow:

	Nov. 6	December 5		
	Close	High	Low	Close
Dec.	36.24	34.22	33.95	34.00
Mar.	36.58	34.91	34.70	34.70
May	36.72	35.30	35.09	35.12

Synthetic Rubber

(Dry Types—Per Pound)

Butaprene NF	.490 - .500
Butaprene NL	.500 - .510
Butaprene NAA	.540 - .550
Butaprene NXM	.580 - .590
Chemigum 30N4NS	.500 - .510
Chemigum 50N4NS	.500 - .510
Chemigum N3	.580 - .590
G-E Silicone Rubber (compounded)	3.15 -4.00
G-E Silicone Gum (not compounded)	—— -4.48
GR-I	—— - .2075
GR-S	—— - .230
Hycar OR-15	.580 - .590
Hycar OR-25	.500 - .510
Hycar OS-10	.550 - .560
Neoprene Types CG and AC	—— - .500
Neoprene Type E	—— - .650
Neoprene Types FR and KNR	—— - .800
Neoprene Type GN	—— - .380
Neoprene Type GN-A	—— - .380
Neoprene Type RT	—— - .400
Neoprene Type S	—— - .380
Neoprene Type W	—— - .400
Paracril B	.500 - .510
Paracril BJ	.500 - .510
Paracril C	.580 - .590
Silastic (compounded)	2.35 -4.40
Thiokol Type A	—— - .470
Thiokol Type FA	—— - .640
Thiokol PR-1	—— - .950
Thiokol Type ST	—— -1.000

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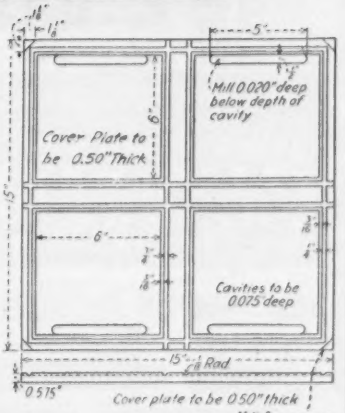
Cover Plate to be 0.50" Thick
Mill 0.020" deep below depth of cavity
Cavities to be 0.075 deep
Cover plate to be 0.50" thick
Mill four corners ¼ deep for prying mold apart

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CURRENT MARKET PRICES

Of Rubber Chemicals and Compounding Ingredients

DECEMBER 5, 1952

Prices are, in general, f.o.b. works. Range of prices indicates grade or quantity variations.

Abbreviations: bbls., barrels; c.l., carlot; cyl., cylinder; dlvd., delivered; dms., drums; l.c.l., less than carlot; M.B., masterbatch; min., minimum; ref., refined; sap., saponified; sp., special; syn., synthetic; t.c., tank cars.

***For Export Only**

The arrangement of this section closely follows the Chemical Section of the 1951-52 RUBBER RED BOOK. Readers are referred to the RUBBER RED BOOK for the correct classification of any material or brand name. Suppliers of every material are contacted for price information. However, only those materials are listed for which quotations have been furnished within the past six months. The quotations are not guaranteed and prospective purchasers should contact suppliers for information. Suppliers are requested to send current price information to the Market Editor, RUBBER AGE.

ACCELERATORS

A-1 (Thiocarbanilide)	lb.	.48 -	.55
A-32	lb.	.61 -	.68
A-77	lb.	.47 -	.60
A-100	lb.	.47 -	.60
Accelerator No. 8	lb.	— -	1.01½
Accelerator—49	lb.	.49½ -	.50½
Accelerator—552	lb.	— -	2.07
Accelerator—808	lb.	.61 -	.63
Accelerator—833	lb.	1.17 -	1.19
Altax	lb.	.43½ -	.45½
Ancap *	lb.	.34 -	.36
Ancatax *	lb.	.42 -	.44
Ancazate * BU (ET & ME)	lb.	— -	1.00
Ancazide * ET	lb.	— -	1.00
ME	lb.	— -	1.10
Arazate	lb.	— -	2.23½
Beutene	lb.	.61 -	.63
Bismate, Rodform	lb.	— -	3.00
Butasan	lb.	— -	1.03½
Butazate	lb.	— -	1.03½
Butyl Eight	lb.	1.00 -	1.35
Captax	lb.	.35 -	.37
C-P-B	lb.	— -	1.95
Cumate, Rodform	lb.	— -	1.45
Dibenzo G-M-F	lb.	— -	2.58½
Diorthotolylguanidine	lb.	.54 -	.55
Diphenylguanidine	lb.	.44½ -	.50½
El-Sixty	lb.	.46½ -	.53½
Ethasan	lb.	— -	1.03½
Ethazate	lb.	— -	1.03½
Ethex	lb.	— -	1.00
Ethyl Thiurad	lb.	— -	1.03½
Ethyl Tuex	lb.	— -	1.03½
Ethylac	lb.	.91 -	.93
G-M-F	lb.	— -	2.58
Good-rite Erie	lb.	.35 -	.37
Guantal	lb.	.55 -	.62
Harvex	lb.	.52 -	.57
Hepteen	lb.	.43½ -	.45½
Base	lb.	1.80 -	1.85
Ledate, Rodform	lb.	— -	1.00
Merac	gal.	.75 -	.80
Mercaptobenzothiazole	lb.	.35 -	.37
Mercaptobenzothiazyl Disulfide	lb.	.43½ -	.45½
Mertax	lb.	.45½ -	.52½
Methasan	lb.	— -	1.03½
Methazate	lb.	— -	1.03½
Monex	lb.	— -	1.13½
Mono Thiurad	lb.	— -	1.13½
Morfex	lb.	.61 -	.63
2-MT	lb.	— -	.77½
NA-22 (for neoprene)	lb.	— -	1.50
O-X-A-F	lb.	.44½ -	.46½
Pentex	lb.	— -	1.03½
Flour	lb.	— -	.20½
Permalux (for neoprene)	lb.	— -	2.17
Phenex	lb.	.49 -	.54
Pip-Pip	lb.	— -	2.07
R-2 Crystals	lb.	— -	2.20
Rotax	lb.	.45½ -	.47½
RZ-50	lb.	— -	1.00
SA 52	lb.	— -	1.13½
SA 57	lb.	— -	1.03½
SA 62	lb.	— -	1.03½
SA 66	lb.	— -	1.50
SA 67	lb.	— -	1.03½
SA 77	lb.	— -	1.03½
Safex	lb.	— -	1.15
Santocure	lb.	.68 -	.75
Selazate	lb.	— -	1.45
Selenac (Ethyl, Methyl)	lb.	— -	1.50
Setsit-5	lb.	.75 -	1.05
SPDX-GH (tons)	lb.	.64 -	.69
GL	lb.	— -	.95
Tellurac	lb.	— -	1.45
Tepidone	lb.	.45 -	.48
Tetrone A	lb.	— -	1.91
Thiofide	lb.	.43½ -	.50½
S	lb.	.46½ -	.53½
Thionex	lb.	— -	1.13½
Thiotax	lb.	.35 -	.42
Thiurad	lb.	— -	1.13½
Thiuram E	lb.	— -	1.03½
M	lb.	— -	1.13½
Trimene	lb.	.56 -	.58
Base	lb.	1.03 -	1.06
Tuads, Ethyl	lb.	— -	1.03½
Tuads, Methyl	lb.	— -	1.13½
Tuex	lb.	— -	1.13½
Ultex	lb.	1.00 -	1.05
Unads	lb.	— -	1.10
Ureka Base	lb.	.66 -	.73
Vitasan Crystals	lb.	.48 -	.53
Vulcacure NB	lb.	— -	.45
ZB	lb.	— -	.85
ZE	lb.	— -	.85
ZM	lb.	— -	.85
Z-B-X	lb.	— -	2.45
Zenite	lb.	.43½ -	.45½
A	lb.	.51½ -	.53½
Zenite Special	lb.	.44½ -	.46½
Zetax (uncoated)	lb.	.44½ -	.46½
Zimate, Butyl	lb.	— -	1.03½
Zimate, Ethyl	lb.	— -	1.03½
Zimate, Methyl	lb.	— -	1.03½

ACTIVATORS

Blue Lead Sublimed (dlvd.)	lb.	.13¼ -	.14¼
Fish Oil, Hydrogenated, Fatty Acid			
Hydrofol Acid (dlvd.)	lb.	.11 -	.14¾
Hyfac 430 (dlvd.)	lb.	.14 -	.15¼
Neo-Fat H.F.O. (dlvd.)	**lb.**	**.14½ -**	**.15¾**
Stearex Beads (dlvd.)	**lb.**	**.12 -**	**.13¼**
Lime, Hydrated			
Arrowhead	ton	— -	20.65
Marblehead	ton	— -	15.00
Sierra	ton	— -	19.50
Litharge			
Eagle (dlvd.)	lb.	— -	.1675
SB (dlvd.)	lb.	— -	.1675
Magnesium Oxide, Heavy			
General Magnesite 500	lb.	.05 -	.06½
600	lb.	.06 -	.08
Michigan No. 15	lb.	.0550 -	.0600
Permanente	lb.	.05 -	.06½
Magnesium Oxide, Light			
Baker's (Neoprene Grade)	lb.	— -	.31
General Magnesite (Neoprene Grade)	lb.	— -	.30
General Magnesite No. 101	lb.	— -	.19
General Magnesite Standard	lb.	— -	.22
K & M (Neoprene Grade)	lb.	.30 -	.31
Maglite D	lb.	— -	.25
M	lb.	— -	.31
Marine's (Neoprene Grade) (l.c.l.)	lb.	— -	.31
Michigan No. 30	lb.	— -	.24
No. 40 Extra Light	lb.	— -	.31
Witco Extra Light	lb.	.32 -	.35
Oleic Acid			
Emersol 210 (dlvd.)	lb.	.11¾ -	.14¾
L.C.P. Red Oil	lb.	.11¾ -	.14¾

ACTIVATORS (Cont'd)

Palm Oil Fatty Acid (c.l.)	lb.	.11½ -	.14½
Potassium Oleate (drums)	lb.	.45 -	.55
Red Lead			
Eagle	lb.	— -	.1775
No. 2 RM (dlvd.)	lb.	— -	.1775
Sodium Laurate, 75%	lb.	.64 -	.74
Sodium Oleate, 75%	lb.	.45 -	.55
Paste (drums)	lb.	— -	.20
Sodium Stearate, 75%	lb.	.45 -	.55
USP Grade (drums)	lb.	— -	.37
Stearic Acid, Single Pressed			
Emersol 110 (dlvd.)	lb.	.11½ -	.12¾
Groco 53	lb.	.11½ -	.12¾
Stearex B (dlvd.)	**lb.**	**.13½ -**	**.16¼**
Stearic Acid, Double Pressed			
Groco 54	lb.	.12 -	.13¼
Stearic Acid, Other			
Neo-Fat 1-58	**lb.**	**.1190 -**	**.1315**
1-60	**lb.**	**.1400 -**	**.1525**
1-65	**lb.**	**.1450 -**	**.1575**
White Lead Basic Carbonate	lb.	.1625 -	.1725
White Lead Basic Sulfate	lb.	.1919 -	.2019
Zinc Laurate			
Laurex	lb.	.29 -	.33
Zinc Stearate	lb.	.37 -	.39
Aquazinc	**lb.**	**.20 -**	**.35**

Unclassified Activators

Actifat (dms.)	**lb.**	**— -**	**.18**
Aktone	lb.	.22 -	.23
Barak	lb.	— -	.62
Curade	lb.	.57 -	.59
D-B-A	**lb.**	**— -**	**1.95**
Dibutylamine (dlvd.)	lb.	.53 -	.55¼
MODX	lb.	.295 -	.345
Polyac	lb.	— -	1.65½
Ridacto (drums)	lb.	.25 -	.26
Snodette (dlvd.)	lb.	.16 -	.17¼
SOAC (min. 10 dms.)	cwt.	— -	8.00
Vulklor	lb.	.75 -	.85

ANTI-COAGULANTS

Anhydrous Ammonia (l.c.l.)	**lb.**	**.17 -**	**.21**
Aqua Ammonia (dms.)	lb.	.031 -	.035
M.B.M. (l.c.l.)	lb.	— -	.35

ANTI-FOAMING AGENTS

Aero Anti Foam H	lb.	— -	.20
Regular	lb.	— -	.12
D.C. Antifoam A	lb.	5.65 -	6.65
Antifoam A Emulsion	lb.	2.30 -	4.00
Defoamer A-25	lb.	— -	3.00
Deltyl Prime	lb.	.70 -	.82
Defoamer 630	lb.	— -	.12½
Kessco X-3 (dms.)	lb.	— -	.47¾
Modicol A	lb.	.12 -	.15
B	lb.	.35 -	.40
RS-968	lb.	.38 -	.38½
Terpinol Prime No. 1	lb.	.39 -	.54

ANTI-OXIDANTS

Agehest 1293-22A	lb.	1.90 -	2.00
Agerite Alba	lb.	2.27½ -	2.37½
Gel	lb.	.62 -	.64
Hipar	lb.	.94 -	.96
H. P.	lb.	.69½ -	.71½
Powder	lb.	.50½ -	.52½
Resin	lb.	.67 -	.69
Resin D	lb.	.50½ -	.52½
Stalite	lb.	.50½ -	.52½
White	lb.	1.45 -	1.55
Akroflex C	lb.	.69½ -	.71½
F	lb.	.69½ -	.71½
Aminox	lb.	.50½ -	.52½
Antioxidant 2246	lb.	1.65 -	1.68
Antox	lb.	.50½ -	.52½
Aranox	lb.	— -	3.25
Benzoquinone	lb.	1.50 -	1.75
Betanox Special	lb.	.72½ -	.74½
B-L-E	lb.	.50½ -	.52½
Carvacrol	lb.	— -	.78
Deenax	lb.	.95 -	1.05
Di-tert-Butyl-para-Cresol	lb.	.91 -	.95
Eugenol C-95%	lb.	3.34 -	3.54
Flectol H	lb.	.50½ -	.57½
Flexamine	lb.	.69½ -	.71½
Neozone A	lb.	.52½ -	.54½
C	lb.	— -	.69½
D	lb.	.50½ -	.52½

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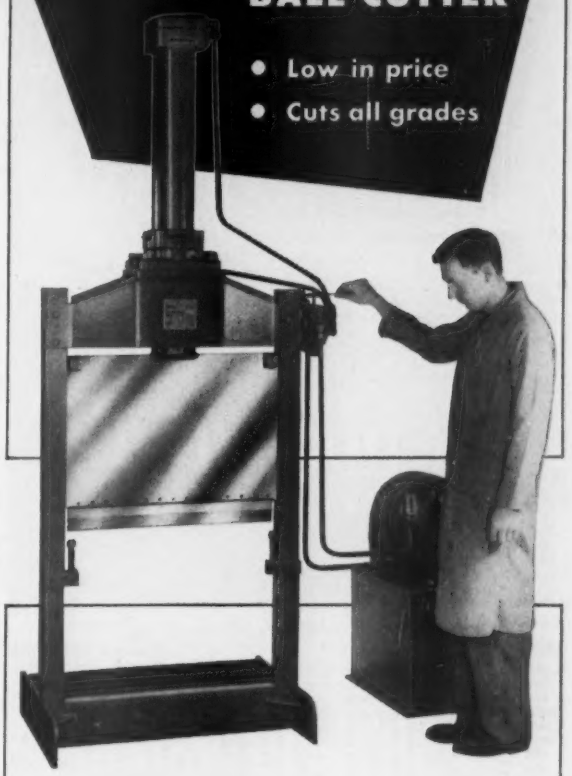

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ANTI-OXIDANTS (Cont'd)

Oxidex	lb.	——	3.60
PDA-10 and 20	lb.	.39	.41
Permalux	lb.	——	2.10
Resorcin, Tech. (dlvd.)	lb.	.82½	.83½
Santoflex AW	lb.	.75	.82
B	lb.	.50½	.57½
BX	lb.	.62	.69
35	lb.	.69½	.76½
Santovar-A	lb.	1.50	1.57
O	lb.	1.30	1.37
Santowhite Crystals	lb.	1.60	1.67
Santowhite L	lb.	.50½	.57½
MK	lb.	1.29	1.36
S.C.R. (tons)	lb.	.32	.34
Sequestrene AA	lb.	——	1.00
NA2	lb.	——	.82
NA3	lb.	——	.80
Stabilite	lb.	.53	.55
Alba	lb.	.72	.77
L	lb.	.53	.55
White	lb.	.49	.51
Stabilizer No. 1	lb.	——	1.55
Stabilizer No. 9-A	lb.	.80	1.05
Sunolite	lb.	.20	.23
Tannic Acid, Tech.	lb.	.46	.48
Thermoflex A	lb.	.98	1.00
V-G-B	lb.	.67	.69
Wing-Stay S	lb.	.50	.51

ANTI-SCORCHING AGENTS

Armeen HT	lb.	.34	.42
Benzoic Acid—Tech.	lb.	——	.43
Good-rite Vultrol	lb.	.60	.62
Sodium Acetate 60-62% Crystals	lb.	——	.06

ANTISEPTICS AND GERMICIDES

Arquad S	lb.	.22	.25
Formaldehyde (dms.)	lb.	.066	.071
G-4 (bbls.)	lb.	1.04	1.19
G-11	lb.	2.60	2.75
Nuodex 100 S.S. (dlvd.)	lb.	——	1.10
Nuodex 100 W.D. (dlvd.)	lb.	——	1.25
Nuodex Zinc 8% (dms.) (dlvd.)	lb.	.24	.28
Ortho Cresol (26°-27°)	lb.	——	.201
Retarder D	lb.	.42	.50
Soligen Drier—Copper 8% (dms.)	lb.	.23½	.24¼
Copper 6% (dms.)	lb.	.18¼	.19½
Zinc 8% (dms.)	lb.	.22¼	.23½
Zinc 8% (dms.)	lb.	——	.21¼
Vancide	lb.	——	.80

ANTI-WEBBING AGENTS (for Latex)

Webnix 34	lb.	1.50	2.25

AROMATICS (DEODORANTS)

Airkem 115	gal.	——	6.50
122	gal.	——	6.50
Alamasks	lb.	.50	6.50
Bouquet 149	lb.	——	3.00
Coumarin	lb.	——	2.75
Curodex 19	lb.	——	4.75
188	lb.	——	5.75
198	lb.	——	6.75
Deodorant 65	lb.	——	1.85
Deodorant L-37	lb.	2.00	2.40
L-44	lb.	2.50	2.90
N.L.T.X.	lb.	1.85	2.15
Deodorant Oil GD 3427	lb.	1.70	2.00
GD 6422	lb.	2.00	2.50
GD 6423	lb.	1.60	1.90
GD 6575	lb.	2.45	2.95
GD 31063	lb.	2.65	3.15
Latex Perfume 5	lb.	——	3.25
6	lb.	——	7.50
9	lb.	——	.65
Naugaromes (dms.)	lb.	1.50	3.00
Neutroleum Delta	lb.	——	2.60
Gamma	lb.	——	3.60
Parador A	lb.	1.95	2.25
C	lb.	2.75	3.25
E	lb.	.25	.55
GD 5280	lb.	2.00	2.50
GD 5348	lb.	1.90	3.25
Perfume Oil Bouquet Vanilla M	lb.	2.40	2.75
Rodo No. 0	lb.	4.00	4.50
No. 10	lb.	5.00	5.50
Rubbarome (dms.)	lb.	1.00	3.80
Rubber Perfume 12	lb.	——	2.85
Russian Leather 7	lb.	——	4.35
Vanillin	lb.	3.00	4.05

BLOWING AGENTS

Ammonium Bicarbonate (dlvd.)	lb.	.0725	.1075
Blowing Agent CP-925	lb.	——	.35
Sodium Bicarbonate, U.S.P. (c.l. bags)	cwt.	——	2.10
Sponge Paste	lb.	——	.20
Unicel	lb.	——	.82
ND	lb.	——	1.11
S	lb.	——	.20
Urea	lb.	.0425	.0475

BONDING AGENTS

Braxe	gal.	6.00	7.50
Durez 12987	lb.	.48	.53
Kalabond	gal.	6.50	7.75
MDI	lb.	4.00	5.00
50	lb.	2.00	2.50
Penacolite B1A	lb.	——	.88

BONDING AGENTS (Cont'd)

Pliobond 20	gal.	2.91	4.23
30	gal.	3.63	4.97
Resinite	gal.	6.75	7.25
Rex Compounds	gal.	1.30	2.85
Ty-Ply Q (BN & S)	gal.	6.75	8.00

COAGULANTS

Acetic Acid—56% (bbls.)	cwt.	9.00	11.00
Glacial—99½% (bbls.)	cwt.	14.05	14.55
Calcium Nitrate, Tech., Crystals	lb.	.07	.17
Hydroxyacetic Acid—70% (dms.)	lb.	——	.084
Zinc Nitrate, Tech.	lb.	——	.22½

COLORING AGENTS

Black

Aquablak B (also M, R)	lb.	.08	.11¼
Aquablak S	lb.	.11	.11½
Black Shield 4-35 (dms.)	lb.	——	.0825
Carbon Black—See *Reinforcing Agents*			
Lampblack No. 10	lb.	.06	.09
Mapico Black Iron Oxide (50 lb. bags)	lb.	.11¾	.12
Pure Black Iron Oxide	cwt.	11.75	12.00

Blue

Blue GD, Dispersed	lb.	——	4.55
Blue GD Paste	lb.	——	1.80
Milori Blue	lb.	.45	.48
Monastral Fast Blue CPL	lb.	——	1.77
PCD, Dispersed	lb.	——	2.50
Ramapo Blue	lb.	3.40	3.45
Rubber Blue X-1999	lb.	——	1.70
Stan-Tone Blue	lb.	1.40	4.00
Ultramarine	lb.	.14	.30
Vansul Blue M.B.	lb.	.90	2.65
Victoria Blue BP-262-D	lb.	2.25	2.30

Brown

Brown Iron Oxide	lb.	.11¾	.12
Mapico Brown (50 lb. bags)	lb.	.12¾	.13

Green

Filo Green	lb.	——	.32
Green Chromium Oxide, Pure	lb.	.37½	.44½
Green Chromium Oxide, Pure, Hydrated	lb.	.95	1.05
Green FD, Dispersed	lb.	——	1.85
Monastral Fast Green GSD, Dispersed	lb.	——	3.20
GSL	lb.	——	1.97
Permanss Green CP-594	lb.	——	1.35
Pigment Green B	lb.	——	1.35
GL-652D	lb.	.88	.93
Ramapo Green	lb.	——	4.00
Rubber Green X-1292	lb.	——	1.15
Stan-Tone Green	lb.	1.50	3.30
Vansul Green M.B.	lb.	1.05	3.05

Maroon

Stan-Tone Maroon	lb.	3.00	3.05
Vansul Maroon M.B.	lb.	1.05	2.80

Orange

Molybdate Orange	lb.	——	.44
Orange FD, Dispersed	lb.	——	2.75
Rubber Orange X-2065	lb.	——	3.00
Stan-Tone Orange	lb.	1.65	4.00
Vansul Orange M.B.	lb.	2.25	2.60

Red

Antimony Trisulfide	lb.	.72	.78
R. M. P. Sulfur Free	lb.	——	.78
R. M. P. No. 3	lb.	——	.72
Cadmium Red	lb.	.95	1.25
Cadmolith Red (bbls.)	lb.	1.75	2.00
Graphic Red (dlvd.)	lb.	——	.85
Indian Red, American, Pure	lb.	.12¼	.12½
Doxco (English)	lb.	.11½	.11¾
Mapico Reds (50 lb. bags)	lb.	.1225	.1250
Oximony Iron Oxide	lb.	——	.09
Red Iron Oxide, Light	lb.	.12¼	.12½
Red PBD, Dispersed	lb.	——	1.75
2BD, Dispersed	lb.	——	1.80
2BL	lb.	——	1.32
PBL	lb.	——	1.65
Rubanox Red CP-762 (dlvd.)	lb.	——	1.40
Rubber Red CP-339 (dlvd.)	lb.	——	1.10
Rubber Red X-1148	lb.	——	.85
Rubbered	lb.	.1150	.1175
Solfast Red	lb.	1.40	1.95
Stan-Tone Red	lb.	1.10	3.05
Sun Burnt Red	lb.	.1150	.1175
Vansul Red M.B.	lb.	.95	3.40
Watchung Red	lb.	——	1.95

White—Lithopone

Albalith	lb.	.0750	.0850
Cryptone BT	lb.	.10	.11
Eagle	lb.	.06½	.06½
Permolith	lb.	.0790	.0890
Ponolith	lb.	.0790	.0865
Sunolith	lb.	.0790	.0865

COLORING AGENTS (Cont'd)

White—Titanium Pigments

Ti-Cal	lb.	.08	.08¾
Ti-Pure	lb.	.21	.24
Titanox A—all grades (dlvd.)	lb.	.21	.22
RA (dlvd.)	lb.	.23	.24
RA-10 (dlvd.)	lb.	.23	.24
RA-NC (dlvd.)	lb.	.23	.24
RC (dlvd.)	lb.	.08¼	.08¾
RC-HT (dlvd.)	lb.	.08	.08½
Unitane O-220	lb.	.195	.205
OR-250	lb.	.215	.225
Zopaque	lb.	.21	.22

White—Zinc Oxide (American Process)

AZO-ZZZ 11 (and 22, 23, 44, 55)	lb.	.1425	.1525
Eagle	lb.	.1425	.1525
Horse Head Special	lb.	.1425	.1525
XX Red	lb.	.1425	.1525
XX-505	yb.	.1575	.1675
Protox 166	lb.	.1425	.1525
167	lb.	.1425	.1525
St. Joe Black Label	lb.	.1425	.1525
Green Label	lb.	.1425	.1525
Red Label	lb.	.1425	.1525

White—Zinc Oxide (Dispersed)

Dispersed Zinc Oxide	lb.	——	13

White—Zinc Oxide (French Process)

AZO-ZZZ 66	lb.	.1650	.1750
Eagle Green Seal	lb.	.1600	.1700
Eagle Red Seal	lb.	.1550	.1660
Eagle White Seal	lb.	.1650	.1750
Florence Green Seal	lb.	.1600	.1700
Red Seal	lb.	.1550	.1650
White Seal	lb.	.1650	.1750
Kadox 25	lb.	.1650	.1750
Kadox 15, 17 and 72	lb.	.1425	.1525
U. S. P. 12	lb.	.1750	.1850

White—Zinc Sulfide

Cryptone ZS-800	lb.	.2530	.2630

Yellow

Benzidine Yellow	lb.	1.91	2.15
Cadmolith Yellow (bbls.)	lb.	——	1.27
Chrome Yellow	lb.	——	.31
Iron Oxide, Pure	lb.	.10	.10¼
Mapico Yellow (50 lb. bags)	lb.	.1000	.1025
Rubber Yellow X-1940	lb.	——	2.15
Stan-Tone Yellow	lb.	1.00	2.25
Toluidine Yellow	lb.	——	1.91
YL-556-D	lb.	——	.82
Oximony Iron Oxide	lb.	——	.06¾
Vansul Yellow M.B.	lb.	1.05	1.85
Yellow GD, Dispersed	lb.	——	2.15
GL	lb.	——	1.62
Zinc Yellow	lb.	——	.25

DISPERSING AGENTS

Anchoid*	lb.	.24	.25
Armeen 18	lb.	.42	.50
Blancol Conc. Powder	lb.	.15½	.17½
Darvan No. 1 (and No. 2)	lb.	.22	.30
Daxad 11 (21, 23)	lb.	.08	.35
Dispersaid	lb.	1.25	1.35
Furala	lb.	.06½	.07½
Halloid	lb.	.04½	.05½
Lomar PW	lb.	——	.16
Marasperse C	lb.	.06½	.06¾
CB	lb.	.12¼	.13¼
N	lb.	.09½	.10½
Modicol C	lb.	.08	.12
Rubbex	lb.	.267	.285
Stan-Chem BQC	lb.	.12¼	.17¼
1067	lb.	——	.13½
1471	lb.	.1687	.2187
2251	lb.	.12¼	.17¼
Trenamine D-25	lb.	.32½	.36
Triethanolamine (drums) (dlvd.)	lb.	.24½	.27½
Yelkin TT	lb.	.14	.18
Zinsper	lb.	——	.15

EXTENDERS

Advagum 1098	lb.	——	.64
Arcco 1071-13B	lb.	.14½	.15½
1073-18B	lb.	.13½	.14½
1294-36B	lb.	.11½	.12½
Bunaweld Polymer No. 780	lb.	——	.22
No. 5514	lb.	——	.35
D-92 (and D-93) (dms.)	lb.	——	.12
Car-Bel-Ex-A	lb.	——	.14
Extender 600	lb.	——	.1480
Polyco 418	lb.	.17	.18
PR-162 Latex Extender	gal.	——	1.55
Synprolac	lb.	.16	.23
Synprowax	lb.	——	.23
Vistanex	lb.	——	.32

SIMPLEX
REG. TRADE MARK

CUT 2500 FEET OF STRIP PER HOUR

The Simplex Model RB-2 is a new high-speed, portable strip cutter that cuts efficiently and accurately.

The new Model RB-2 has a maximum cutting thickness of two inches, weighs 44.5 pounds, and is available in both A.C. and D.C. types. Manually operated, the machine is capable of cutting up to 20,000 feet of rubber strip in eight hours. A series of slits in the edge of the cutting blade carries water from a reservoir into the cut and not just to the top of the rubber being cut. This method lubricates the entire cut and produces a straight and even edge.

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Manufacturers of a Complete Line of Cloth Cutting Machinery

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CUTTING AND PERFORATING DIES

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FILLERS (Inert and Reinforcing)

Abrasives			
Carbonite	lb.	.19¼	1.30
Lionite	lb.	.14	1.20
Pumice	lb.	.03	.05
Aluminum Hydrate	lb.	.07	.10
Aluminum Silicate			
Marter White	ton	18.50	30.00
Barium Carbonate (l.c.l.)	ton	72.50	90.00
Barytes			
No. 1 Floated, White	ton	37.85	53.60
No. 2 Floated, Unbleached	ton	35.85	51.60
No. 22 Barytes (c.l.)	ton	—	20.00
Foam A	ton	—	37.60
Bentonite (c.l.)	ton	—	12.50
Argosite Clay (c.l.)	ton	—	12.50
Bennett Clay (c.l.)	ton	—	32.50
SPV Volclay (c.l.)	ton	—	12.50
Blanc Fixe	ton	72.50	120.00
Calcium Carbonate			
Atomite (c.l.)	ton	—	30.00
B.I. White No. 1 (c.l.)	ton	—	7.50
B.I. White No. 2 (c.l.)	ton	—	7.00
Blue Star XX	ton	—	15.50
Calcene NC	ton	—	72.50
TM	ton	75.00	95.00
Caltec	ton	40.00	57.50
Calwhite	ton	—	17.00
Camelwite	ton	—	30.00
Gamaco	ton	—	30.00
Kalite (c.l.)	ton	—	50.00
Laminar	ton	—	30.00
Lesamite (c.l.)	ton	—	27.50
Millical (c.l.)	ton	—	32.50
Multifex	ton	—	120.00
M	ton	—	110.00
Non-Fer-Al	ton	—	25.00
Purecal D	ton	51.75	66.75
M	ton	46.50	66.75
T	ton	110.00	125.00
U	ton	120.00	135.00
Sierracal	ton	15.00	18.50
Super Multifex	ton	—	160.00
Surfex (c.l.)	ton	—	35.00
Suspenso (c.l.)	ton	—	30.00
Witcarb B	ton	51.75	66.75
P	ton	110.00	125.00
R	ton	120.00	135.00
R-12	ton	46.50	66.75
York White	ton	—	9.50
Calcium Silicate			
Silene EF	ton	120.00	140.00
Calcium Sulfate, Anhydrous			
Snow White Filler	ton	—	20.50
Calcium Sulfate, Hydrous			
Terra Alba No. 1	ton	12.00	14.40
Chalk Whiting (l.c.l.)	lb.	.0150	.0175
Recco Paris Whiting	ton	—	33.00
Clay			
Aiken Clay	ton	—	14.00
Alsilite (c.l.)	ton	20.00	45.00
Alsite (c.l.)	ton	—	14.00
Aluminum Flake	ton	17.00	60.00
Buca (c.l.)	ton	—	45.00
Burgess No. 20	ton	—	35.00
No. 30	ton	—	37.00
Burgess Iceberg	ton	—	50.00
Burgess Polyclay	ton	—	45.00
Catalpo (c.l.)	ton	—	35.00
Champion	ton	—	14.00
C.S.D. (c.l.)	ton	—	13.50
Crown	ton	—	14.00
Dixie (c.l.)	ton	—	14.00
Hi-White R	ton	—	13.50
Hydratex R	ton	—	30.00
Kaolloid Clay (c.l.)	ton	—	10.50
Markham (c.l.)	ton	14.00	35.00
McNamee (c.l.)	ton	—	13.50
Oldham (c.l.)	ton	13.50	35.00
Paragon	ton	—	13.50
Pigment 5	ton	21.85	36.00
Pigment 22	ton	17.00	22.50
Pigment 33	ton	—	37.00
Recco (c.l.)	ton	—	14.00
RX-43	ton	—	33.00
Stan-Clay	ton	25.00	30.00
Stellar-R	ton	—	50.00
Suprex	ton	—	14.00
Whitetex (c.l.)	ton	—	50.00
Diatomaceous Earth	ton	30.00	50.00
Kaylorite (c.l.)	ton	—	30.00
Lorite	ton	—	30.00
Flock			
Cotton, white and colored	lb.	.13	.33
Filfloc F 40-9000	lb.	—	.16
Filfloc F 6000	lb.	—	.40
Polycel	ton	110.00	210.00
Rayon, bleached or dyed	lb.	.87	1.50
Rayon, grey	lb.	—	.18
Rayon, pink	lb.	—	.18
Solka-Floc (l.c.l.)	lb.	.07	.16
Glue, Bone (dlvd.)	lb.	.18	.20½
Leather, Shredded	lb.	.05	.17
Lignin	lb.	.03	.06
Indulin	lb.	.09	.10
Limestone, Pulverized	ton	3.25	10.00
Georgia Marble No. 10	ton	—	10.00
Industrial Filler No. 100	ton	—	5.75
Micro Velva	ton	45.00	48.00
Velvet Filler, Superfine	ton	—	27.00
Magnesium Carbonate	lb.	.0950	.1050
K & M Clearcarb	lb.	.1225	.1275
Magnesium Oxide	lb.	.05	.06

FILLERS (Cont'd)

Magnesium Silicate	ton	18.00	35.00
Airex	ton	25.00	27.00
Asbestol	ton	—	25.00
Blue Star Talc	ton	—	23.00
L.S. Silver	ton	23.50	25.50
Sierra White	ton	21.25	23.25
Mica	lb.	.01¼	.07¾
Concord	lb.	.07	.07¾
Micro-Mica	lb.	.06¾	.07½
Mineralite (c.l.)	ton	25.00	85.00
Silversheen	lb.	.07¼	.08
Triple A Mica (c.l.)	ton	—	25.00
Vermiculite	lb.	—	.11
Wet Ground Biotite Mica	lb.	.05½	.06¼
Wet Ground Mica No. 160	lb.	.07	.07¾
Pyrophyllite			
Pyrax A (c.l.)	ton	—	13.50
WA (c.l.)	ton	—	16.00
Silica	ton	16.00	27.00
Blue Star	ton	—	20.60
Slate, Powdered (l.c.l.)	ton	15.00	20.00
Talc, Domestic	ton	10.00	27.00
Nytal 200	ton	—	25.00
300	ton	—	36.00
Walnut Shell Flour	ton	45.00	111.00
Whiting, Commercial	ton	—	7.00
Camel-Carb	ton	—	10.00
C-C-O White	ton	—	18.00
Georgia Marble No. 15	ton	—	15.00
No. 16	ton	—	16.00
Keystone (c.l.)	ton	—	16.00
Rambo No. 1 White	ton	—	8.50
No. 6 White	ton	—	9.00
Snowflake (c.l.)	ton	—	18.00
Veroc (c.l.)	ton	—	8.50
Welco (c.l.)	ton	—	8.50
York White R (c.l.)	ton	—	8.50
Wood Flour	ton	22.00	49.00

FINISHING MATERIALS, SURFACE

Beaco Finishes	gal.	2.10	2.35
Black Out	gal.	4.50	8.00
Shellac, Orange Gum	lb.	.40	.45
VanWax	gal.	1.45	1.50

FLAME RETARDANTS

Chlorowax 70	lb.	.18	.19
Halowax	lb.	.27	.42
Zinc Borate 3167	lb.	.1920	.2020
Zyrox	lb.	.49	.78

LUBRICANTS, MOLD

Aquadag	lb.	3.50	4.00
Aquarex D	lb.	—	.80
L	lb.	—	.94
MDL	lb.	—	.33
WAQ	lb.	—	.28
Akro Gel	lb.	—	.165
Borax, Granular (l.c.l.)	ton	81.00	86.00
Carbowax 4000	lb.	.33	.34
CD Mold Release A	gal.	—	7.00
Colite Concentrate (dms.)	gal.	—	.90
Concentrex	lb.	—	.25
D.C. 7 Compound	lb.	5.25	6.50
D.C. Emulsion No. 7	lb.	1.90	2.32
No. 35	lb.	1.59	3.50
No. 35A	lb.	1.59	3.50
No. 35B	lb.	1.59	3.50
D.C. Mold Release Fluid	lb.	3.70	6.00
Dipex	lb.	.14	.18
Dri-Lube	lb.	—	.22
Glydag	lb.	1.30	2.00
Hawkeye Flake (dlvd.)	lb.	—	.11
Kokobace	lb.	—	.12
Lubrex	lb.	.25	.30
Lubri-Flo	gal.	10.00	12.00
Migralube	lb.	—	.35
Mold Lubricant No. 72 Conc.	gal.	2.50	4.00
No. 735	gal.	1.26	2.75
No. 769	gal.	1.20	2.60
Moldeze No. 3	gal.	5.00	6.00
Mold-Brite	gal.	—	1.50
Mold-Stick	lb.	.253	.271
Mold-White	gal.	—	2.00
Monopole Oil MD	lb.	—	.23
Nopcolube	lb.	—	.15
Orvus WA Paste (dms.)	lb.	—	.26
Prodag	lb.	.28	.42
Purity Flake (dlvd.)	lb.	—	.13
Rubber-Flo	gal.	1.25	1.60
Rubber-Glo	gal.	—	.94
Rusco Mold Paste	lb.	—	.25
Sericite (l.c.l.)	ton	65.00	75.00
Thermalube	lb.	—	.13¾
Ucon Lubricants	lb.	.28	.37
Ulco Mold Soap	lb.	.12	.23

LUBRICANTS, RUBBER

Diglycol Stearate Neutral (and SE) (dms.)	lb.	—	.25
Extrud-o-Lube	gal.	—	1.54
G.B. Naphthenic Neutrals	gal.	.11	.18
Latex-Lube GR (dlvd.)	lb.	.19¼	.20
Pigmented (dlvd.)	lb.	.18¾	.19¼
RS	lb.	—	.16½
Liqui-Lube (dlvd.)	lb.	—	.16¼
NF (dlvd.)	lb.	—	.16¾
NT (dlvd.)	lb.	—	.16¾
Propylene Stearate (dms.)	lb.	.68	.78

LUBRICANTS, RUBBER SURFACE

Barium Stearate	lb.	.37	.39
Calcium Stearate	lb.	.35	.37
D.C. 4 Compound	lb.	5.13	6.50
D.C. 200 Fluid	lb.	3.70	6.00
Glycerized Lubricant	gal.	—	1.48
Hydro-Zinc	lb.	—	.20
Polyethylene Glycol	lb.	.26½	.29
Rexanol	lb.	—	.13
Separex	lb.	—	.25
Stock-Lube	lb.	—	.19
Slab-Dip	lb.	—	.15
Wet-Zinc	lb.	—	.22¼
Zinc Stearate	lb.	.37	.39
Z.S.D. Dispersion	lb.	—	.20

MOLD CLEANERS

Actusol (dlvd.)	gal.	1.45	1.65
Alkon (dlvd.)	lb.	.16	.16½
Metso 99	cwt.	4.00	5.85
Granular	cwt.	3.50	5.15
Rubber-Sol	gal.	2.97	3.97
Shelblast	ton	80.00	140.00
Sprex A.C. (dlvd.)	lb.	.17¾	.18¾

PEPTIZING AGENTS

Peptizer P-12	lb.	.84	1.00
Pepton 22	lb.	.74½	.77½
RPA 2	lb.	—	.77½
3	lb.	—	.47½
3-RO	lb.	—	.50½
5	lb.	—	.59

PLASTICIZERS & SOFTENERS

AA (dms.)	lb.	.26	.27½
Acto 500	lb.	—	.09
Adipol BCA (dms.)	lb.	.45½	.46
2EH	lb.	.47½	.48½
10A	lb.	.47½	.48½
ODY	lb.	.51¾	.52¾
American Pine Tar	lb.	.0410	.0678
Arneel	lb.	.22	.27
Arolene 1980 (c.l.)	lb.	—	.10
Aromatic Tar	gal.	.0573	.1973
Bardol	lb.	.02½	.03½
B	lb.	.05¾	.06
Bayol D	gal.	—	.382
F	gal.	—	.52
Beeswax, Bleached	lb.	.85	.90
Yellow Refined	lb.	.70	.75
Bondogen	lb.	.55	.60
B.R.C. No. 20	lb.	.0150	.0160
B.R.H. 2	lb.	.0280	.0290
BRS 700	lb.	.0175	.0260
B.R.T. 3	lb.	.024	.025
4	lb.	.0225	.023
7	lb.	.0265	.027
B.R.V.	lb.	.0350	.051
Bunarex Resins	lb.	.06½	.07½
Bunatak AH	lb.	.08	.09
U	lb.	—	.17½
No. 90	lb.	—	.09
No. 210	lb.	—	.14
Burgundy Pitch	lb.	.0843	.0888
Butac	lb.	.10½	.11½
Butoxyethyl Diglycol Carbonate	lb.	.40	.41
Butyl Benzyl Sebacate	lb.	.61	.63¾
Butyl Carbitol Perlargonate (dms.)	lb.	—	.64
Butyl Cellosolve Perlargonate (dms.)	lb.	—	.68
Butyl Palmitate	lb.	—	.26½
Butyl Roleate	lb.	.176	.18
Butyl Stearate-CP (dms.)	lb.	.31	.32
BWH-1	lb.	—	.14
Cabflex Di-BA (dms.)	lb.	.42	.44¾
Di-OA (dms.)	lb.	.43½	.46¼
Di-OP (dms.)	lb.	.40	.42¾
R-100	lb.	.04½	.05½
G.P.	lb.	.0125	.02
R-100	lb.	.04½	.05½
TT	lb.	.02	.02¾
Candelilla Wax Prime	lb.	.67	.75
Capryl Benzyl Sebacate	lb.	.67½	.70¾
Carbonex	lb.	.0325	.0375
S Flakes	lb.	.04	.0475
S Plastic	lb.	.0410	.0460
644	lb.	.0375	.0425
Carbowax 4000 (drums)	lb.	.33	.34
Cardolite 615	lb.	.33¾	.36¾
816	lb.	25¾	.28¾
Carnauba Wax, Crude	lb.	.95	1.10
Refined	lb.	.87	.94
Substitute	lb.	.45	1.08
Yellow	lb.	1.15	1.20
Celluflex (dms.)	lb.	.34	.35
Ceresine Wax	lb.	.14	.26
Chlorowax 40	lb.	.14	.14¾
Contogum	lb.	.06¾	.10¼
CTLA Polymer	gal.	.17½	.32½
Cumar Resins	lb.	.05½	.14½
D.B.M.	lb.	—	.30
Degras, Common	lb.	—	.12
Dibenzyl Sebacate	lb.	.74	.76¾
Dibutoxethyl Sebacate	lb.	—	.5634
Dibutyl Phthalate	lb.	.34	.36¾
Dibutyl Sebacate	lb.	.85½	.88¼
Dicapryl Adipate	lb.	.40½	.43¼

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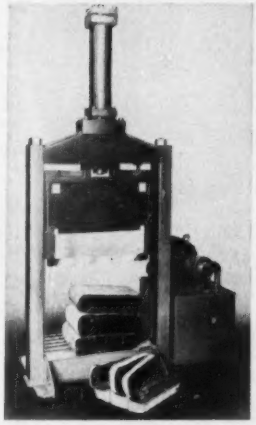

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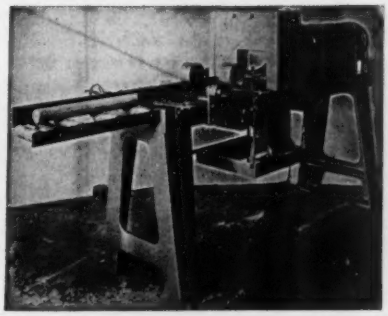

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New York 13, N. Y.

IN CANADA

PLASTICIZERS & SOFTENERS (Cont'd)

Dicapryl Phthalate	lb.	.35	.37¼
Dicapryl Sebacate	**lb.**	**.61½**	**.64¼**
Di-Carbitol Phthalate (dms.)	lb.	.42	.42½
Dicyclohexyl Phthalate	**lb.**	——	.42
Diethyl Phthalate (t.c.)	lb.	.29½	.32¼
Di-2-ethlyhexyl Phthalate (t.c.)	——		.37
Dihexyl Adipate	**lb.**	**.33**	**.35¼**
Dihexyl Phthalate	**lb.**	**.28½**	**.31¼**
Dihexyl Sebacate	**lb.**	**.50**	**.52¾**
Di Isobutyl Azelate (dms.)	lb.	.54	.57
Di-iso-octyl Adipate (dms.)	lb.	.43	.45¾
Di-iso-octyl Phthalate (t.c.)	**lb.**	**.37**	**.39¾**
Dimethyl Phthalate (t.c.)	lb.	.29¾	.30¾
Dimethyl Sebacate	**lb.**	**.77**	**.79¼**
Dinopol	lb.	.42¼	.43¼
Dioctyl Phthalate (dms.)	lb.	.37	.39¾
Dioctyl Sebacate (dms.)	lb.	.73¼	.76
D.I.O.P. (dms.)	lb.	.41¾	.42¾
Dipolymer Oil	gal.	——	.44
Dispersing Oil No. 10	lb.	.05½	.05¾
Dutrex B	lb.	.02¾	.03¼
5 and 6	lb.	.020	.031
15E	gal.	.10	.20
20, 21, 22 and 25	lb.	——	.04
Elastex 10-P	lb.	**.40**	**.42½**
50-B	lb.	**.34½**	**.37**
DCHP	lb.	**.42½**	**.43½**
Estac	**lb.**	——	.16
Ethox (dms.)	lb.	.45½	.45¾
Flexol B-400	lb.	.28	.30
DHP	lb.	.46	.48¾
DOP	lb.	.40	.42¾
TOF	lb.	.49	.51¾
3GH	lb.	.44	.46
3GO	lb.	.53	.55
4GO	lb.	.37	.39¼
8HP	lb.	.40	.42¾
Flexricin P-1 (and 4)	lb.	——	.36
P-4C	lb.	——	.46½
P-8	lb.	——	.36
Pale 4	lb.	.28	.29½
Galex W-100	lb.	.15½	.19¼
G. B. Light Process Oil	lb.	**.025**	**.0325**
Medium Process Oil	lb.	.03½	.04¼
G. B. Naphthenic Neutrals	gal.	.11	.18
Good-Rite GP233	lb.	.45¾	.48½
GP261	lb.	.40	.42¾
Harflex 500 (dms.)	lb.	**.36½**	**.39¼**
Herron-H.T.	gal.	.16	.27
Herron-Plas	lb.	——	**.03¾**
Herron-Wax	lb.	.05¼	.06
No. 23	lb.	.08¼	.08¾
No. 24	lb.	.07¼	.07¾
HSC No. 13	lb.	.27	.30
Hylene B	lb.	.45	.50
C	lb.	.41	.46
D	lb.	**.47½**	**.52½**
Indonex 632½ (633½, 634½, 638½)	gal.	.1100	.1700
Kapsol	lb.	.34	.35
Kenflex	lb.	.18	.26
Kesscoflex 101 (dms.)	lb.	——	.39
102 (dms.)	lb.	——	.32½
103 (dms.)	lb.	——	.41½
104 (dms.)	lb.	——	.48
105 (dms.)	lb.	——	.33¼
106 (dms.)	lb.	——	.35½
KP 23 (dms.)	lb.	.31	.32
120 (dms.)	lb.	.31	.32
140 (dms.)	lb.	.4774	.4825
201	lb.	.54¼	.55¾
504	lb.	.35¾	.36¼
555	lb.	.33	.33½
Kremol 40	gal.	.36	.46
Kremol 40	gal.	.39	.49
50	gal.	.39	.49
Kronisol (drums)	lb.	.38¼	.39¼
Kronitex (drums)	lb.	.37¼	.38¼
Lanolin, Tech. Anhydrous	lb.	.23	.25
Lead Oleate	**lb.**	——	**.30½**
Lindol (dms.)	**lb.**	**.34**	**.35**
2-Mercaptoethanol (drums)	lb.	1.25	1.50
Methox (dms.)	lb.	.41¼	.41¾
Methyl Laurate	lb.	.25	.27
Methyl Oleate	**lb.**	——	**.20**
Methyl Stearate (dms.)	lb.	——	.30
Modicol G	lb.	——	.23
R	lb	——	.17
Montan Wax, Crude	lb.	.15	.18
Monten Wax	lb.	.12	.13
Monty Wax	lb.	——	**.30½**
Morflex	lb.	.37	.72½
Natac	lb.	.10	.11
Nebony Resins (dms.)	lb.	.04	.04½
Neolene 210 (t.c.)	**lb.**	——	.16
212 (t.c.)	**lb.**	——	.14
220 (t.c.)	**lb.**	——	.15
Nerium	**lb.**	——	**.09**
Nevillac Resins (dms.)	lb.	.28	.55
Neville Resins (dms.)	lb.	.12	.18
Nevindene Resins (dms.)	lb.	.15	.18
Nevinol (dms.)	lb.	——	.20
Nevoll	lb.	.02½	.03½
Nevtex 10 (dms.)	lb.	.11	.12½
Nuba 1 (and 2) (dms.)	lb.	.05¾	.06¼
3X (dms.)	lb.	.07¾	.08¼
15 (and 30) Oil (dms.)	lb.	**.36¼**	**.38**
No. 480 Oil Proof Resin	lb.	——	.18
Ohopex Q10 (dms.)	lb.	.40¾	.41¾
Opalwax	lb.	.37	.38
Ortho-Nitrobiphenyl	**lb.**	**.06**	.11
Ozokerite Wax No. 64			
White	**lb.**	**.31**	**.32**
Yellow	**lb.**	**.25**	**.26**

PLASTICIZERS & SOFTENERS (Cont'd)

Palm Oil	**lb.**	——	.11
Paradene Resins (dms.)	lb.	.06½	.07½
Para Flux (dms.)	gal.	.1925	.2025
2016 (dms.)	gal.	.22	.23
Para Lube (l.c.l.)	lb.	.046	.048
Parmo	lb.	.06	.13½
Pepton 22	lb.	.72	.75
PG-16 (drums)	lb.	——	.22¼
Picco 10 (and 25)	lb.	——	.13½
75 (and 100)	lb.	——	.13
Rubber Resin 100	lb.	.1855	.1905
S.O.S.	gal.	——	.29
Piccocizer 30	lb.	——	.05½
Piccolastic A (and B, C, D, E)	lb.	.28½	.29
FT, FHF and FX	lb.	——	.1815
T-135	lb.	.22¾	.23¼
Piccolyte S Resins	lb.	.18½	.20
Piccolyte WW Resins	lb.	.45	.47
Piccoumaron Resins	lb.	.06¾	.17
Piccovar	lb.	.14½	.15
Piccovol	lb.	——	.02½
Pictar	gal.	——	.25
Pigmentar	lb.	.0410	.0678
Pigmentaroil	lb.	.0410	.0678
Plastac M	**lb.**	——	**.09¼**
Plasticizer 2286	lb.	——	**.26¼**
Plasticizer SC	lb.	**.49**	**.52**
Plasticizer W-13	lb.	**.37**	**.38¼**
Plasticizer XP-3	**lb.**	——	**.50**
Plastoflex 50	lb.	.34	.38
55	lb.	.34	.38
520	lb.	.37½	.38½
VS	lb.	.40	.43
Plastogen	lb.	**.07¾**	**.08**
Plastolein 9050 (c.l.)	lb.	.59¼	.62¼
9055	lb.	.37½	.40½
9058	lb.	.57	.60
9250	lb.	.27	.30
9715	lb.	.37½	.40½
Plastone	lb.	**.27**	**.30**
Polycin 781	lb.	.40	.41
Polyco 438	lb.	.34	.36
Polymel C-128	**lb.**	**.19½**	**.20½**
D	lb.	**.22**	**.24**
H-2	lb.	.22	.24
6	lb.	**.06¾**	.10
7	gal.	.23	.28
Process Oil C-255 (c.l.)	gal.	——	.22
Propylene Stearate (dms.)	lb.	——	**.32**
PT 400 Pine tar (600, 800) (t.c., dms.)	lb.	.0410	.0534
PX-104	lb.	.34	.42
PX-108	lb.	.38	.46
PX-208	lb.	.41½	.49
PX-404	lb.	.60	.68
Reogen	lb.	.13¼	.13½
465 Resin (dms.)	lb.	.07	.07½
Resin 731-C	cwt.	——	15.00
Resin C	lb.	.0200	.0285
Resinex	lb.	**.03¼**	**.03¾**
L-4	lb.	**.02¼**	**.03**
Rexflex	lb.	——	.15
Rosin Oil	gal.	**.54**	1.20
R.S.O. Softening Oil	lb.	**.03**	**.05**
Rubberol	lb.	——	.25¼
Rubtar	**gal.**	——	**.40**
Santicizer B-16	lb.	.50	**.52**
E-15	lb.	.47	.49
M-17	lb.	.44	.46
No. 107	lb.	.40	**.42½**
No. 140	lb.	.29	.31
No. 141	lb.	.40	**.42½**
No. 160	lb.	.34	.36
Sherolatum	lb.	.03½	.06
Softener No. 20	**gal.**	**.09**	**.25**
Staflex IXA	lb.	**.34**	.36
Stanolind Petrolatum	lb.	.048	.086
Wax	lb.	.31	.32¾
Staybelite Resin (dms.)	cwt.	——	12.00
Sunny South Burgundy Pitch	lb.	.0980	.1025
Sunny South Pine Tar	lb.	.0410	.0678
Sunny South Rosin Oil	gal.	.58	.87½
Superla Wax	lb.	.27¾	.32
Syncera Wax	lb.	.19	.24
Syn Tac (c.l.)	**gal.**	——	**.33**
Synthetic Revertant Oil	lb.	——	.16
Tar, Refined	gal.	**.12**	.17
K-Tarnel NR (t.c.)	lb.	——	.0851
Terpene A	gal.	——	.65
TP-90B	lb.	——	.59
TP-95	lb.	——	.65
TP-98	lb.	——	.65
Triacetin	lb.	**.34**	**.45**
Tricresyl Phosphate (t.c.)	lb.	.33	.35¾
Turgum S	lb.	**.08¾**	**.09¾**
Vanadiset A	**gal.**	**.13**	**.20**
Vistac No. 1	gal.	1.00	1.16
P	lb.	.18	.18½
Vopcolene 50	lb.	——	.37
Witresin—Granular	**ton**	**41.00**	**43.00**
Solid	ton	36.00	38.00

PROCESSING AIDS

Calcium Riconoleate	lb.	——	.57
Castor Oil, Processed (dms.)	lb.	——	.35¼
Refined (drums)	lb.	——	.19¼
Castorwax (min. 250 lbs.)	lb.	——	.27¼
Dutrex 7	lb.	.12	.20
ELA	lb.	——	.82¼
Millrex	**lb.**	——	**.15**

PROCESSING AIDS (Cont'd)

Polycin 783	lb.	——	.31½
Resin No. 510	**lb.**	**.13½**	**.16½**
Zyrox	lb.	.50	.79

PROTECTIVE & STABILIZING AGENTS

Acacia	lb.	**.12¾**	**.21**
Alpha Protein	lb.	**.24**	**.28**
Ammonium Alginate	lb.	——	.95
Aroostoocrat	lb.	——	**.07½**
Carob Bean Flour	lb.	——	**.46**
Casein	lb.	**.28**	**.38**
Ethylene Diamine 68%	lb.	.47	.50
Karaya Gum	**lb.**	**.20**	**.50**
Prosein	lb.	.0600	.0630
Rex Compound No. 2801	lb.	——	**.15**
Stablex B	lb.	.50	.95
K	lb.	**.27**	**.35**

RECLAIMING AGENTS

Armeen C	lb.	.50	.58
T	lb.	.42	.50
No. 517 H.B. Oil	gal.	.11½	.16½
535	gal.	**.22**	**.27**
Burco RA	lb.	.05½	.08¼
C-6 Oil (and 28, 32)	**gal.**	**.33**	**.38**
C-10 Oil	gal.	.25	.30
C-33 Oil	gal.	——	.21½
Caustic Soda—Flake 76%			
(c.l., drums)	cwt.	——	3.75
Liquid 50% (t.c.)	cwt.	——	2.55
Solid 76% (c.l., dms.)	cwt.	——	3.35
Cresylic Acid (99-100%)	gal.	1.20	1.39
D-4	gal.	——	.27
E-5	gal.	——	.25
G. B. Reclaiming Oil	**gal.**	**.12**	**.18**
CD-10	gal.	.10	.16
CD-50-U	gal.	.18	.24
Gensol No. 6 (t.c.)	gal.	——	.45
Heavy Aromatic Naphtha	gal.	——	.12¼
LX-77 Reclaiming Solvent	gal.	.21	.33
LX-572 Reclaiming Oil	gal.	.27	.32
LX-777 Reclaiming Oil	gal.	.23	.33
Neo-Fat D-242	lb.	.05½	.07¼
PRR 1	gal.	.15	**.35**
PT 67 Light pine oil	gal.	.50	.60
PT 101 Pine tar oil	lb.	.0410	.0534
Q Oil	gal.	——	.286
Reclaiming Oil 1621	**lb.**	**.03**	**.04**
Reclaiming Oil 3186 (t.c.)	gal.	**.28**	**.38½**
Reclaiming Oil 3186-G	gal.	.25	**.36½**
Reclaiming Reagent No. 4	lb.	.12	**.15**
R.P.A. No. 3	lb.	——	**.46**
RR-10	lb.	——	.35
Soda Ash (c.l., bags)	cwt.	——	1.50
Solvent 534	gal.	**.20½**	**.26½**
Solvent Oil 21	gal.	**.24**	**.29**
C-42	gal.	**.23**	**.28**
Union Solvent 4060-O	gal.	——	.149
X-1 Resinous Oil	lb.	.0210	.0275

REINFORCING AGENTS—CARBON BLACK

Channel, Hard Processing (HPC) (bags)

Atlantic HPC-98	lb.	.0740	.1225
Continental F	lb.	.0740	.1225
Croflex	lb.	.0740	.1225
Dixiedensed (and S)	lb.	.0740	.1225
Kosmobile (and S)	lb.	.0740	.1225
Micronex HPC	lb.	.0740	.1225
Spheron 4	lb.	.0740	.1225
Witco Disperso No. 6	lb.	.0740	.1225

Channel, Medium Processing (MPC) (bags)

Atlantic MPC-95	lb.	.0740	.1225
Continental A	lb.	.0740	.1225
Croflex TH	lb.	.0740	.1225
Dixiedensed HM (and S-66)	lb.	.0740	.1225
Huber Arrow TX	lb.	.0740	.1225
Kosmobile HM (and S-66)	lb.	.0740	.1225
Micronex Standard	lb.	.0740	.1225
Spheron 6	lb.	.0740	.1225
Texas M	lb.	.0740	.1225
Witco Disperso No. 1	lb.	.0740	.1225

Channel, Easy Processing (EPC) (bags)

Atlantic EPC E-42	lb.	.0740	.1225
Continental AA	lb.	.0740	.1225
Croflex 77	lb.	.0740	.1225
Dixiedensed 77	lb.	.0740	.1225
Kosmobile 77	lb.	.0740	.1225
Micronex W-6	lb.	.0740	.1225
Spheron 9	lb.	.0740	.1225
Texas E	lb.	.0740	.1225
Witco Disperso No. 12	lb.	.0740	.1225
Wyex	lb.	.0740	.1225

Channel, Conductive (CC) (bags)

Continental R-40	lb.	.1800	.2400
Dixie 5 Dustless	lb.	.0950	.1550
Dixie Voltex	lb.	.1950	.2500
Kosmink Dustless	lb.	.0950	.1550
Kosmos Voltex	lb.	.1950	.2500
Spheron C	lb.	.1400	.1850
Spheron N	lb.	.2500	.3000
Voltex	lb.	.1950	.2500

Conductive Furnace Black (CFB) (bags)

Shawinigan Acetylene Black	lb.	.1600	.2200
Vulcan C	lb.	——	.1100

Furnace, Fast Extruding (FEF) (bags)

Arovel	lb.	.0600	.1000
Croflex 50	lb.	.0600	.1000
Dixie 50	lb.	.0600	**.1000**
Kosmos 50	lb.	.0600	**.1000**
Statex M	lb.	.0600	**.1000**
Sterling SO	lb.	.0600	**.1000**

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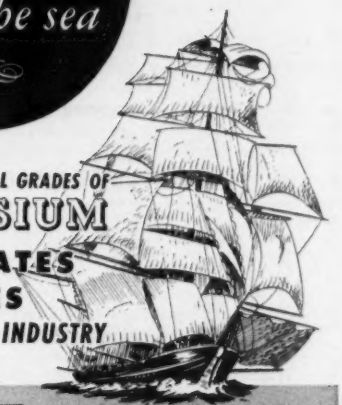

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REINFORCING AGENTS—CARBON BLACK (Cont'd)

Furnace, General Purpose (GPF) (bags)

Sterling V	lb.	.0500 -	.0900

Furnace, High Modulus (HMF) (bags)

Collocarb	lb.	.0550 -	.0950
Continex HMF	lb.	.0550 -	.0950
Croflex 40	lb.	.0550 -	.0950
Dixie 40	lb.	.0550 -	.0950
Kosmos 40	lb.	.0550 -	.0950
Modulex	lb.	.0550 -	.0950
Statex 93	lb.	.0550 -	.0950
930	lb.	.0550 -	.0950
Sterling L	lb.	.0550 -	.0950

Furnace, Medium Abrasion (MAF) (bags)

Philblack A	lb.	.0600 -	.1000

Furnace, Semi-Reinforcing (SRF) (bags)

Continex SRF	lb.	.0400 -	.0800
Croflex 20	lb.	.0400 -	.0800
Dixie 20	lb.	.0400 -	.0800
Essex	lb.	.0400 -	.0800
Furnex	lb.	.0400 -	.0800
Gastex	lb.	.0450 -	.0850
Kosmos 20	lb.	.0400 -	.0800
Pelletex	lb.	.0400 -	.0800
Sterling NS	lb.	.0400 -	.0800
Sterling R	lb.	.0450 -	.0850
Sterling S	lb.	.0400 -	.0800

Furnace, Fine (FF) (bags)

Statex B	lb.	.0650 -	.1050
Sterling 99	lb.	.0650 -	.1050

Furnace, High Abrasion (HAF) (bags)

Aromex	**lb.**	**.0790 -**	**.1250**
115	lb.	.0890 -	.1290
Continex HAF	lb.	.0790 -	.1250
Croflex 60	lb.	.0790 -	.1175
Dixie 60	lb.	.0790 -	.1175
Kosmos 60	lb.	.0790 -	.1175
Philblack O	lb.	.0790 -	.1190
Statex R	**lb.**	**.0790 -**	**.1250**
Vulcan 3	**lb.**	**.0790 -**	**.1220**

Furnace, Super Abrasion (SAF) (bags)

Philblack E	lb.	.1350 -	.1750
Statex 125	lb.	.1100 -	.1550

Thermal, Fine (FT) bags)

P-33 (c.l.)	lb.	— -	.0550

Thermal, Medium (MT) (bags)

Thermax (c.l.)	lb.	— -	.0350
Thermax, Stainless (c.l.)	lb.	— -	.0450

REINFORCING AGENTS—SILICA

Hi-Sil	lb.	.10 -	.11½

REINFORCING AGENTS—MISCELLANEOUS

Darex Copolymer No. 3	lb.	.47 -	.49
X34	lb.	.42 -	.44
X43 (and 43E)	lb.	.42 -	.44
Darex Copolymer Latex No. 3-L (and X34L)	lb.	.36½ -	.39
Durez 12687 (and 12707)	lb.	— -	.37
Durez 13355	lb.	— -	.29½
Good-Rite Resin 50	lb.	.42 -	.44
Kralac A	lb.	.43 -	.44
Marbon S and S-1	lb.	.42 -	.49
8000	lb.	.42 -	.49
Marmix	lb.	.42 -	.49
Pliolite Latex 190	**lb.**	**.30 -**	**.34**
Pliolite NR	**lb.**	**.74 -**	**.76**
Pliolite S3, S6, and S6B	lb.	.43 -	.44
C-3 Masterbatch	lb.	.58 -	.59
C-4 Masterbatch	lb.	.56 -	.57
G Masterbatch	lb.	.45 -	.46
G50 Masterbatch	lb.	.45 -	.46
N Masterbatch	lb.	.49 -	.50
R Masterbatch	lb.	.63 -	.64
WA	lb.	.68 -	.75
S113V76	lb.	.48 -	.55
Polyco 220	lb.	.22 -	.23

RETARDERS

Dutch Boy Normasal	lb.	— -	.46
ESEN	lb.	.35 -	.37
Retarder ASA	lb.	.35 -	.37
Retarder PD	lb.	.35 -	.37
Retarder T.C.M.	lb.	— -	.65
Retarder W	lb.	— -	.44½
Retardex	**lb.**	**.47 -**	**.50**

RUBBER SUBSTITUTES

Mineral Rubber

38	**ton**	**38.00 -**	**40.00**
Black Diamond	**ton**	**38.00 -**	**40.00**
Byerlyte	**ton**	**47.00 -**	**54.00**
Gilsonite, Selects (c.l.)	ton	37.00 -	38.00
Hard Hydrocarbon (dms.)	ton	46.50 -	48.50
Herron Flake	ton	— -	45.00
Mineral Rubber, solid	**ton**	**42.50 -**	**44.50**
Pioneer	**ton**	**35.00 -**	**46.00**

Vulcanized Vegetable Oils (Factice)

Amberex	lb.	.29 -	.36
Brown	lb.	.1425 -	.2680
Dispersed	lb.	.26 -	.42
Neophax	lb.	.1570 -	.2680
White	lb.	.1440 -	.2850

Miscellaneous Rubber Substitutes

G.B. Asphaltenes	lb.	.06 -	.06½
Gilsowax B	lb.	.09 -	.11
Resin No. 1098 (drums)	lb.	— -	.62
No. 1198	lb.	.46¾ -	.49¾

SOLVENTS

Acetone (dlvd.)	lb.	.08½ -	.11
American Dipentine	gal.	.44½ -	.68
American Pine Oil	gal.	.75½ -	.95½
Amsco Lactol Spirits (t.c.)	gal.	— -	.18
Rubber Solvent (t.c.)	gal.	— -	.17
Solv A (t.c.)	gal.	— -	.25½
Solv A-80 (t.c.)	gal.	— -	.30½
Solv B (t.c.)	gal.	— -	.29
Solv B-90 (t.c.)	gal.	— -	.32
Solv D (t.c.)	gal.	— -	.30½
Special Naphthalite (t.c.)	gal.	— -	.17
Textile Spirits (t.c.)	gal.	— -	.18
Amyl Chlorides, Mixed (l.c.l.) (drums)	lb.	.10 -	.11
Benzol 90%	gal.	— -	.48
Butyl Acetate (t.c.)	lb.	.15¼ -	.17¾
Butyl Alcohol (t.c.)	lb.	.16 -	.18½
Secondary (dlvd.)	lb.	.11 -	.13½
Tertiary (dlvd.)	**lb.**	**12 -**	**.14½**
Carbon Bisulfide, Tech	**lb.**	**.0440 -**	**.0800**
Carbon Tetrachloride	**lb.**	**.08 -**	**.08½**
Cosol 1	gal.	.37 -	.43
Cosol 2	gal.	.42 -	.48
Cyclohexane	**lb.**	**.09¼ -**	**.11¾**
Cyclohexanone	lb.	.25 -	.27 a
Diacetone, Pure (dlvd.)	lb.	.12 -	.14½
Dichlorethyl Ether (dms.)	lb.	.15 -	.17
Formal (dms.)	lb.	.29¾ -	.31¼
Dichloropentane (l.c.l.)	lb.	.04 -	.07
Dicom	**gal.**	**.30 -**	**.42**
Halowax Oil	lb.	.28 -	.41
Heptanes (t.c.)	gal.	.17 -	.22
Hexalin Cyclohexanol	**lb.**	**.20 -**	**.22** a
Hexanes (t.c.)	gal.	.17 -	.22
Isopropyl Alcohol, Ref. 99% (dlvd.)	gal.	.40 -	.57
Ether, Ref. (dlvd.)	gal.	.05 -	.07½
Mesityl Oxide (dlvd.)	**lb.**	**.11½ -**	**.14**
Methyl Acetone, Syn. (dms., dlvd.)	gal.	.54½ -	.72¼
Methyl Ethyl Ketone	lb.	.11 -	.13½
Methyl Isobutyl Ketone (dlvd.)	lb.	.13 -	.15½
N-5 Pentane Mix. (t.c.)	**gal.**	**— -**	**.13¼**
N-6 Hexanes (t.c.)	gal.	— -	.14½
N-7 Hexanes (t.c.)	gal.	— -	.13½
Penetrell	gal.	.44½ -	.68
Petrolene (t.c.)	gal.	— -	.13125
Picolines, Alpha, Refined	lb.	— -	.40
Mixed	lb.	— -	.30
Proprietary Alcohol (t.c.)	gal.	— -	.43½
Pyridine, Refined	lb.	— -	1.05
Quinoline	lb.	— -	.61¼
Rubber Solvent (t.c.)	gal.	— -	.16
Ruhsol (t.c.)	gal.	— -	.11875
Skellysolve B (Hexanes) (t.c.)	**gal.**	**— -**	**.148**
C (Heptanes) (t.c.)	gal.	— -	.141
E (Octanes) (t.c.)	**gal.**	**— -**	**.155**
R (Solvent Naphtha)	gal.	— -	.114
Solvent, Crude, Light	gal.	.19 -	.28
Solvesso 100 (t.c.)	**gal.**	**— -**	**.28**
150 (t.c.)	gal.	— -	.28
Sunny South Dipentine	gal.	.44½ -	.68
Sunny South Pine Oil	gal.	.75½ -	.95½
Sunray	gal.	.1140 -	.1600
Toluene (drums)	**gal.**	**— -**	**.28**
Toluol (t.c.)	gal.	— -	.45
Trichlorethane	lb.	.11½ -	.13½
Triglycol Dichloride (dms.)	lb.	.59½ -	.60½
Union Thinner 1	gal.	— -	.163
3	gal.	— -	.165
5	gal.	— -	.153
7	gal.	— -	.153
2-50-W Hi-Flash	gal.	— -	.41
X-7 Sp. Heptanes (t.c.)	gal.	— -	.11
Xylol	gal.	— -	.45

STABILIZING AGENTS (for Vinyl Resins)

Basic Silicate White Lead	lb.	.1750 -	.1850
Bunatak Polymer No. 780	lb.	— -	.04
No. 5514	lb.	— -	.35
BVS	lb.	— -	.74¾
Cadmium Stearate	lb.	— -	1.25
Dutch Boy DS-207	lb.	— -	.54
Plumb-O-Sil A	lb.	— -	.29¼
B	lb.	— -	.31½
Tribase	lb.	— -	.27¼
Dythal	lb.	— -	.41
Ferro	lb.	.65 -	1.35
Lead Stearate, Precip.	**lb.**	**.36 -**	**.38**
Fused	lb.	— -	.35½
Lithium Stearate	lb.	.63 -	.65
Stabelan E	lb.	1.25 -	1.40
XL	lb.	.55 -	.65
Stabilizer No. 3	lb.	— -	2.15
Stabilizer No. 21	lb.	— -	1.08
Stabilizer No. 52	lb.	— -	2.15
Stabilizer No. 89	lb.	— -	.75
Stabilizer No. 143	lb.	— -	.85
Stabilizer BC-12	lb.	— -	.90
Stabilizer B-5	lb.	— -	.70
Stabilizer CH-14	lb.	— -	.65
Stabilizer E6B	lb.	— -	.95
Stabilizer ICX	lb.	— -	.68
Stabilizer L	lb.	— -	.60
Stabilizer OM-10	lb.	— -	2.15
Stabilizer OM-18	lb.	— -	3.65
Stabilizer SN	lb.	— -	.48
Stabilizer V-1-N	lb.	— -	.45
Stabilizer V-9	lb.	— -	.85
Stabilizer VL-2	lb.	— -	1.27
Stabilizer VL-3	lb.	— -	1.18

STABILIZING AGENTS (Cont'd)

Stabilizer V-7939	**lb.**	**— -**	**.60**
Staycin 1	lb.	— -	.65
Vanstay L	lb.	.33 -	.35
H	lb.	.75 -	.77
HH	lb.	.98 -	1.00

SUN CHECKING AGENTS

Antisol	lb.	— -	.23
Antisun	lb.	— -	.18½
Heliozone	lb.	.26 -	.27
NBC	lb.	— -	1.55
Sharples Wax	**lb.**	**.23 -**	**.28**
Sunolite	**lb.**	**.20 -**	**.23**
Sunproof	**lb.**	**.25 -**	**.26**
Imp.	lb.	.23 -	.24
Jr.	lb.	.18 -	.19
Tonox	lb.	.51½ -	.53½

TACKIFIERS

Arcco 620-32B	lb.	.20 -	.21
716-30	lb.	.19½ -	.20½
1041-21	lb.	.17½ -	.18½
Galex (drums)	lb.	.15½ -	.19¼
Indopol H-300	gal.	1.00 -	1.16
Koresin	**lb.**	**.73 -**	**.75**
Liquid Rubber Flux	lb.	— -	.14
Nilox (c.l.)	cwt.	— -	15.00
Resin V	**lb.**	**— -**	**.23¼**
Rubtack	**lb.**	**— -**	**.12**
Synthol	lb.	— -	.24¼
Vistac No. 1	**gal.**	**1.00 -**	**1.16**
A	lb.	.21½ -	.22¼
Zirex (c.l.)	cwt.	— -	15.00

THICKENERS (FOR LATEX)

Alcogum AN-6	**lb.**	**— -**	**.05**
AN-10	lb.	— -	.08½
Betanol (drums)	**lb.**	**— -**	**.70**
Emulsorex No. 5	**lb.**	**— -**	**.35**
Lecithin	lb.	.12 -	.17
Modicol VD	**lb.**	**— -**	**.12½**
VE	lb.	— -	.10¾
VF	lb.	— -	.10¾
VK	lb.	— -	.07
Polyco 296	lb.	.15 -	.16
296-N	lb.	.15 -	.16
Propylene Laurate (dms.)	lb.	.57 -	.67
Sodium Silicate	cwt.	1.50 -	2.65

VULCANIZING AGENTS

Selenium

Ancasal*	**lb.**	**— -**	**2.00**
Vandex	lb.	— -	3.50

Sulfur

Blackbird	cwt.	— -	2.30
Crystex	**lb.**	**.19½ -**	**.23**
Darex Dispersed Sulphur	**lb.**	**.12 -**	**.17**
Devil (c.l.)	cwt.	— -	1.75
Dispersed Sulfur	lb.	.12½ -	.14½
Insoluble Sulfur 60	lb.	.12½ -	.13
Spider	cwt.	— -	2.30
Star (c.l.)	cwt.	— -	2.25
Tire (c.l.)	**cwt.**	**— -**	**1.75**
Tube	**cwt.**	**— -**	**2.25**
Vultac 2	lb.	.47 -	.49
3	lb.	.51 -	.53

Tellurium

Ancatel*	**lb.**	**— -**	**2.00**
Telloy	lb.	— -	2.50

WETTING AGENTS

Advawet No. 10	lb.	— -	.20
No. 15	lb.	— -	.21½
No. 33	lb.	— -	.48
Aerosol OT 70% Clear	**lb.**	**.80 -**	**1.00**
Alrosol (dms.)	lb.	— -	.40
Alrosperse	lb.	— -	.18
Aquarex D	lb.	— -	.80
MDL Paste	lb.	— -	.33
ME	lb.	— -	.97
NS	**lb.**	**— -**	**.60**
WA Paste	lb.	— -	.28
Areskap 50	lb.	.30 -	.38
Dry 100	lb.	.60 -	.72
Aresket 240	lb.	.30 -	.38
Dry 300	lb.	.60 -	.72
Aresklene 375	lb.	.42 -	.57
Dry 400	lb.	.70 -	.84
Armacs	lb.	.29 -	.76
Aquads	**lb.**	**.21 -**	**.61**
Etho-chemicals	lb.	.34 -	.80
Kessco E-122 (dms.)	lb.	— -	.49
Lecithin	**lb.**	**.18 -**	**.26**
Modicol L	**lb.**	**— -**	**.58**
N	lb.	— -	.40
S	lb.	— -	.32
Nekal NS	lb.	— -	.28
Nopco 1086-A	**lb.**	**.42 -**	**.50**
1187-X	lb.	— -	.14½
Parnol	lb.	.13 -	.18
Santomerse D	lb.	.44 -	.65
S	lb.	.13 -	.25
Sorapon SB	lb.	.14 -	.15
SF Conc.	lb.	.29 -	.30
Sorbit P	lb.	— -	.25
Stablex G	**lb.**	**.50 -**	**.70**
Tergitol 4 (dms., dlvd.)	lb.	.30 -	.31
7 (dms., dlvd.)	lb.	.42 -	.43
O8 (dms., dlvd.)	lb.	.30 -	.31
P28 (dms., dlvd.)	lb.	.18½ -	.19
Trenamine W-30	**lb.**	**— -**	**.15**
Vultamol	lb.	— -	.17½
Wetsit Conc.	**lb.**	**.25 -**	**.32**

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DESIRE POSITION WITH OPPORTUNITY. Excellent varied experience as rubber chemist, laboratory and plant; management small business, product promotion, advertising planning, personnel supervision. Prefer coastal location, warm climate. Will travel anywhere. Address Box 531-P, RUBBER AGE.

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PLANT SUP'T., CHEMIST: 6 years experience in manufacture of vinyls, natural and synthetic adhesives and cements, rubber formulations, natural and synthetic latices. ADMINISTRATIVE ABILITY. Can handle people. Desires executive position; will consider good sales opportunities. Address Box 543-P, RUBBER AGE.

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25 years experience management, sales engineering, compounding, production of mechanical, molded, extruded, sponge, silicone rubber products. Exceptional success in the designing of products to meet customers' needs—Desires sales position with progressive concern. Address Box 546-P, RUBBER AGE.

RUBBER TECHNICIAN, desires to relocate. Over twenty years experience in the wire and cable industry. Experience includes development and compounding, rubber and plastic extruding, laboratory control, factory control. Can handle people, laboratory and factory coordination. Reliable and steady. Address Box 548-P, RUBBER AGE.

LATEX CHEMIST with ten years experience in compounding, dipping and coating. Is interested particularly in latex research and development work. Address Box 563-P, RUBBER AGE.

CHIEF LATEX CHEMIST, 33, 14 years experience compounding natural and synthetic latices for adhesives, jar closures, dipped goods, slush molding, curled hair fiber binders, latex thread, rug backings, foam sponge, etc. Production, compounding, and preparation of finished products. Considerable technical sales and service. Prefer Technical Sales. Address Box 559-P, RUBBER AGE.

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TECHNICAL SALES REPRESENTATIVE: experienced chemist, desires to represent company on plasticizers, solvents, or other chemical raw material in New York City. Presently selling and servicing, successfully, non-conflicting product to manufacturers of industrial finishes, plastic coated fabrics and papers, adhesives, lacquer specialties, etc. Address Box 566-P, RUBBER AGE.

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MOLD AND/OR DIE DESIGNER. A midwest rubber and plastics company is interested in acquiring the services of an experienced rubber mold or plastics die designer. The individual selected for this position will be responsible for the design, storage and maintenance of all molds and dies. He will supervise those people now engaged in this activity. If you are a graduate engineer or have equivalent experience and feel you can qualify for this position, please write to the box indicated below stating your experience, age, education, approximate salary expected, etc. Please enclose a recent photograph if possible. Address Box 545-W, RUBBER AGE.

RUBBER COMPOUNDER

A real connection for an experienced compounder of extruded rubber goods. Location in the East with strong and going firm operating internationally. Best of working conditions and promotional opportunity. It will pay you to investigate. Address Box 549-W, Rubber Age.

HELP WANTED—Continued

HELP WANTED in reducing tear, increasing building tack in GR-S? Recent advances in compounding with Purecal (Wyandotte's precipitated calcium carbonate, whitest extender known) warrant cost comparison with cheapest natural rubber formulas. For samples, data and consultation, write us. Wyandotte Chemicals Corporation, Calcium Carbonate Sales Dept., Wyandotte, Michigan.

SPONGE CHEMIST: Experienced in chemically blown products for laboratory and factory operations. Real opportunity. All replies confidential. Address Box 532-W, RUBBER AGE.

RUBBER CHEMIST wanted by plant located in southwest employing 150 people. Man with experience in compounding and manufacturing procedures in slab soling and mechanical goods. When applying give full particulars regarding background and salary requirements. Address Box 544-W, RUBBER AGE.

LATEX CHEMIST—Compound development in synthetics, adhesives and coatings. Experience preferred but not essential. Excellent opportunity in growing concern, midwest location. Address Box 550-W, RUBBER AGE.

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WANTED:

COST ESTIMATOR with extruded goods processing experience. Some miscellaneous molded goods experience helpful but not necessary.

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Nationally known firm has real opportunity for adhesive chemist having minimum five years experience compounding resin emulsions, latex, etc. Locate in small upstate New York community. State education, experience and salary requirements. Address Box 555-W, RUBBER AGE.

RUBBER CHEMIST-COMPOUNDER with approximately five years experience for Eastern mechanical rubber goods manufacturer of hose, belting, and molded goods. Duties will include research, development, and production compounding. Please state experience, education, salary required and send small photo. Address Box 554-W, RUBBER AGE.

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Wanted by large New England manufacturer, Rubber Chemists experienced in latex technology. Men with several years experience in technical work in the proofing of fabrics or in industrial rubber products or hard rubber manufacture. Address Box 557-W, Rubber Age.

HELP WANTED—Continued

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INDEX TO ADVERTISERS

A

Accurate Steel Rule Die Mfgrs. 299
Adamson United Co. 312, 313
Adhesive Products Corp. 397
Aetna-Standard Engineering Co. 319
Akron Equipment Co. 411
Akron Presform Mold Co. 369
Akron Rubber Machinery Co. 407
Albert, L., & Son 418
Alco Oil & Chemical Corp. 338
Allen Extrusion Machine Div.
Industrial Ovens, Inc. 407
Aluminum Flake Co. 413
American Cyanamid Co.
Calco Chemical Div. 303, 333
American Machine & Foundry Co. ..... —
American Resinous Chemicals Corp. 405
American Zinc Sales Co. ..... —
Ames, B. C., Company ..... —
Armstrong Machine Works 397
Atlas Electric Devices Co. ..... —

B

Bagley & Sewall Co. ..... —
Baird Rubber and Trading Co. 392
Baker & Adamson Products, General Chemicals
Div., Allied Chemical & Dye Corp. ..... —
Barrett Div., Allied Chemical & Dye Corp. ..... —
Beacon Chemical Industries, Inc. ..... —
Bestread Products Co. 416
Binney & Smith Co. ..... Insert Following 378
Black Rock Mfg. Co. ..... —
Bolling, Stewart, & Company, Inc. 336
Brockton Cutting Die & Machine Co. 409
Brooklyn Color Works, Inc. ..... —
Brown Company ..... —

C

Cabot, Godfrey L., Inc. 337
Cambridge Instrument Co. ..... —
Carey, Philip, Mfg. Co. 417
Carter Bell Mfg. Co. 398
Chemical & Pigment Co., Div. Glidden Co. ..... —
Chemical Publishing Co ..... —
CLASSIFIED ADVERTISING 415, 416, 417, 418
Cleveland Liner & Mfg. Co. 294
Colledge, E. W., General Sales Agent, Inc. ..... —
Columbia-Southern Chemical Corp. ..... —
Columbian Carbon Co. ..... Insert Following 378
Concord Mica Corp. 419
CONSULTANTS SECTION 418
Continental Carbon Co. 317
Coulter, James, Machinery Co. ..... —

D

Diamond Alkali Company
Pure Calcium Prod. Div. ..... —
Dow Corning Corp. 316
du Pont de Nemours, E. I., & Co., Inc.
Rubber Chemicals Div. ..... Second Cover

E

Elm City Rubber Co. ..... —
Emery Industries, Inc. 315
Erie Engine & Mfg. Co. ..... —
Erie Foundry Company 305

F

Farrel-Birmingham Co., Inc. 320, 321
Ferry Machine Co. ..... —
Fidelity Machine Co. Inc. 393
Flexo Supply Co. ..... —

G

Gammeter, W. F., Co. 418
Gelb, R., & Sons, Inc. 417, 418
General Atlas Carbon Co. 331
General Chemical Division, Allied
Chemical & Dye Corp. ..... —
General Latex & Chemical Corp. 401
General Magnesite & Magnesia Co. 405
Genseke Brothers ..... —
Gidley Research Institute 418
Glidden Co., Chemical & Pigment Co. Div. ..... —
Goodrich, B. F., Chemical Co. (Chemical) 291
Goodrich, B. F., Chemical Co. (Hycar) ..... —
Goodyear Tire & Rubber Co.
(Chemical Div.) 293, 295, 297
Gummi und Asbest 417
Gussett Boiler and Welding Co. ..... —

H

Hale & Kullgren, Inc. 319
Hall, C. P., Co. 335
Hardesty Chemical Co., Inc. ..... —
Hardman, H. V., Co., Inc. 399
Harwick Standard Chemical Co. ..... Back Cover
Hercules Powder Company, Inc. 328
Heveatex Corporation ..... —
Hoggson & Pettis Mfg. Co. 405
Holliston Mills, Inc. ..... —
Holmes, Stanley H., Co. 407
Howe Machinery Co., Inc. 413
Huber, J. M., Corp. 340

I

Indoil Chemical Co. ..... —
Industrial Ovens, Inc. 407
Institution of the Rubber Industry 326
Interstate Welding Service ..... —

J

Johnson Steel & Wire Co., Inc. 326

K

K.B.C. Industries, Inc. 416
Kautschuk und Gummi 413

L

Lambert, E. P., Co. ..... —

M

Mapico Color Div., Columbian Carbon Co. ..... —
Marbon Corp. 332
Marine Magnesium Products, Division of
Merck & Co., Inc. 413
Maryland Cork Co. ..... —
Monsanto Chemical Co.
Organic Division ..... —
Morris, H. B. 418
Mt. Vernon-Woodberry Mills, Inc. 309
Muehlstein, H., & Co., Inc. 387
Mumper, James F., Co. 418

N

National Chemical & Plastics Co. ..... —
National Lead Co. 310
National Rosin Oil Products, Inc. 417
National Rubber Machinery Co. ..... —
National Sherardizing & Machine Co. 418
National-Standard Co. 304
Natural Rubber Bureau ..... —
Naugatuck Chemical,
U. S. Rubber Co. 311, 342
Neville Co. 301
New England Engineering 399
New Jersey Zinc Co. 314

O

Olin, R. R., Laboratories 418
Osborn Mfg. Co. 300

P

Pan American Chemicals 397
Pennsylvania Industrial Chemical Corp. 327
Pequanoc Rubber Co. 334
Phillips Chemical Co. 292
Pike, S. J., & Co., Inc. 339
Pittsburgh Coke & Chemical Co. ..... —
Preventive Maintenance Co. ..... —
Production Metal Products Co. Inc. 417
Progressive Service Co. ..... —

R

Rand Rubber Co., Inc. ..... —
Randall, Frank E., Co. ..... —
Rare Metal Products Co. 413
Revue Generale du Caoutchouc ..... —
Richardson, Sid, Carbon Co. 420
Rotex Rubber Company Inc. 415
Royle, John, & Sons 400
Rubber Corp. of America, Latex Div. 413
Rubber Raw Material 396

S

St. Joseph Lead Co. ..... —
Saniseal Mfg. Co. 413
Schrader's, A., Son 391
Schulman, A., Inc. ..... Inside Back Cover
Scott Testers, Inc. 401
Sharples Chemicals Inc. ..... Insert following 324
Shaw, Francis & Co., Ltd. 336
Shell Chemical Corp. ..... —
Shell Oil Company, Inc. 329
Simplex Cloth Cutting Machine Co., Inc. 409
Sivon Machine Co. ..... —
Skelly Oil Co., Solvents Div. 296
Snell, Foster D., Inc. 409
Sorval Ivan, Inc. 396
South Florida Test Service 418
Southeastern Clay Co. 401
Southern Clays, Inc. ..... —
Spadone Machine Co. 411
Stamford Rubber Supply Co. 338
Standard Machinery Co. ..... —
Stanley Chemical Co. 399
Stanley Electric Tool Div. ..... —
Stauffer Chemical Co. 323
Stoner's Ink Co. 419
Sun Oil Co. ..... —

T

Tanney-Costello Inc. 402
Taylor Instrument Companies 322
Testworth Laboratories, Inc. 403
Thiokol Corporation ..... —
Thomaston Mills 409
Titanium Pigment Corp. 298
Tracerlab, Inc. ..... —
Trade News Service ..... —
Tumpeer Chemical Co. ..... —
Turner Halsey Co. 309

U

United Carbon Co. ..... Insert Following 306
United Clay Mines Corp. 407
United Engineering & Foundry Co. ..... —
United Rubber Machinery Exchange ..... —
U. S. Rubber Reclaiming Co. ..... —
Utility Mfg. Co. 411

V

Vanderbilt, R. T., Co. ..... Front Cover
Velsicol Corp. 318

W

Wellington Sears Co. 302
Western Supplies Co. 395
White, J. J., Products Co., Inc. ..... —
Whittaker, Clark & Daniels, Inc. 411
Williams, C. K., & Co. 394
Wills Rubber Trimming Machine Co. ..... —
Wilson, Charles T., Co., Inc. 403
Witco Chemical Co. 317
Woloch, George Co. 403
Wood, R. D., Co. ..... —
Wyandotte Chemicals Corp. 416

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